

June 1946

TECHNOLOGY REVIEW

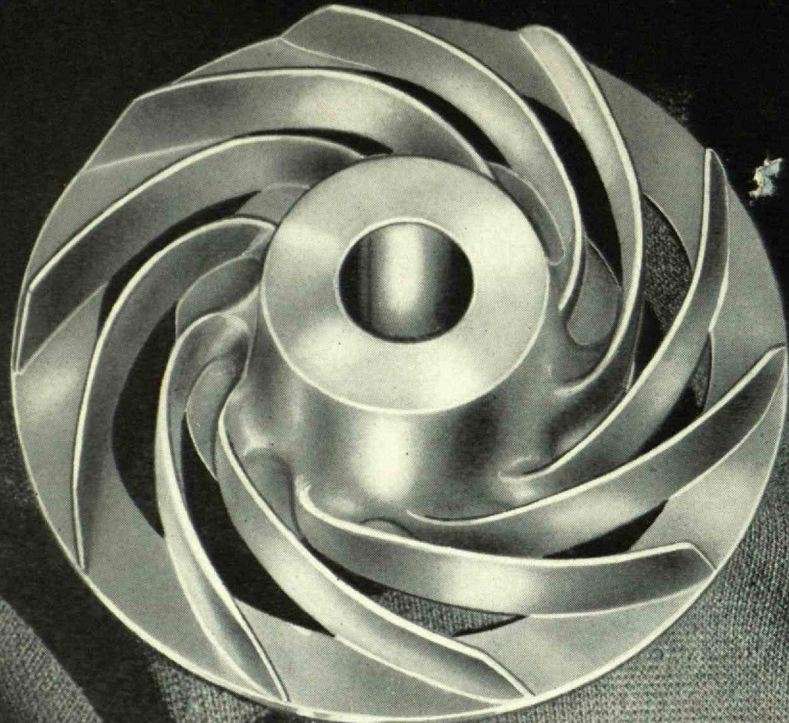
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technology review

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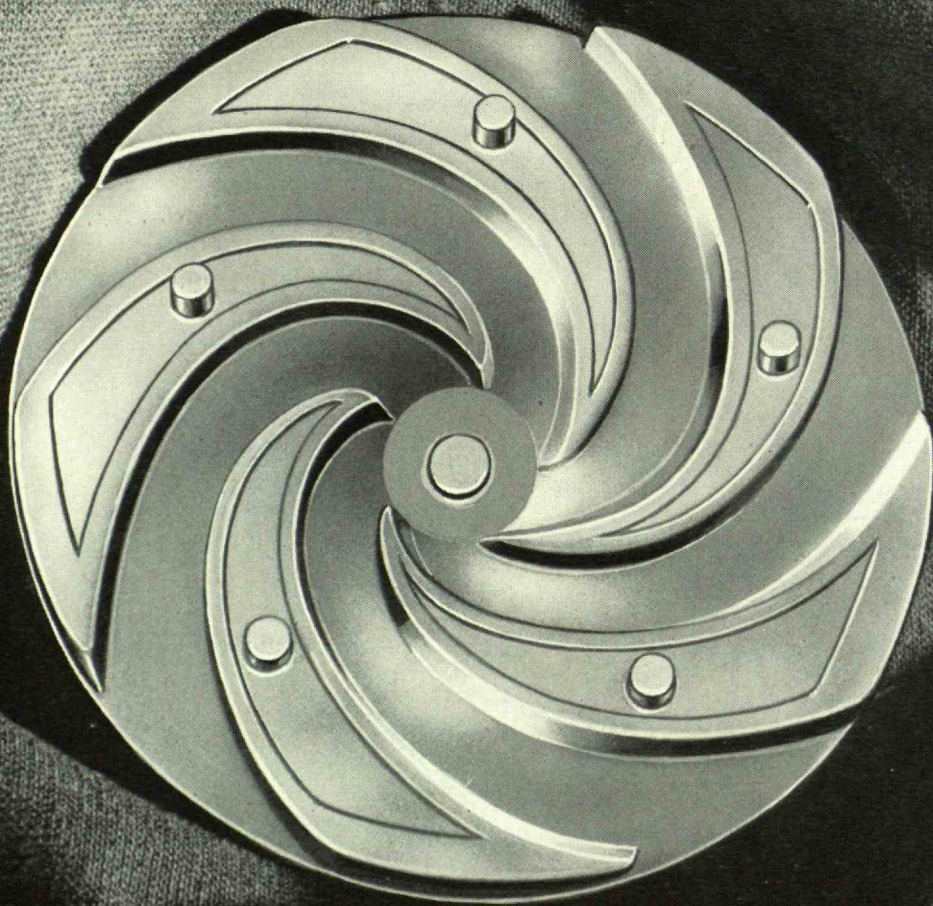
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FOR ECONOMICALLY
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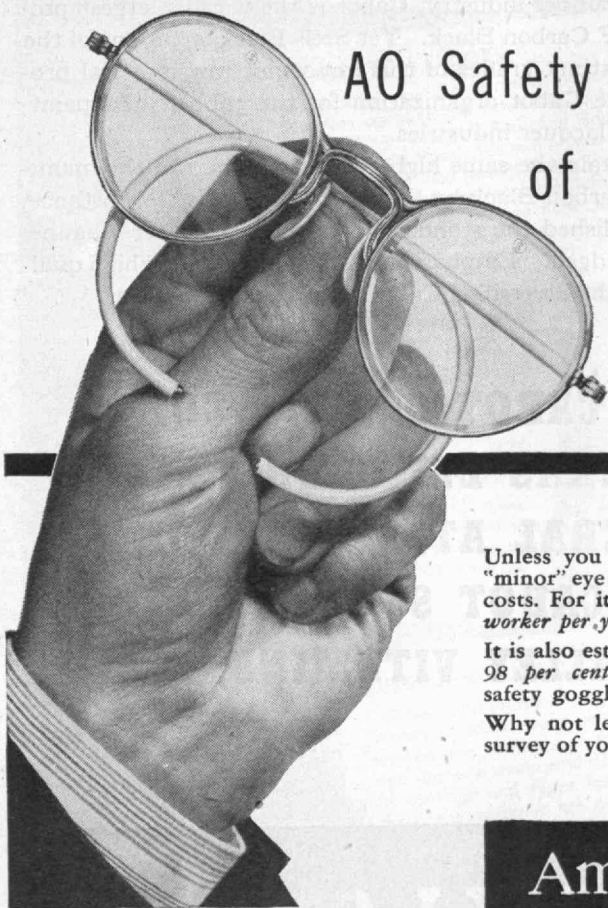
FORGINGS IN ALUMINUM • BRASS • BRONZE • COPPER • MAGNESIUM • MONEL • ALLOYS

MACHINING FACILITIES

You Might Be Surprised If
You Check on What Eye
Accidents are **Costing**
You



AO Safety Goggles Safeguard the Eyes
of Industry . . . **Reduce**
Production **Costs**



Unless you have an adequate eye-protection program, even so-called "minor" eye accidents are probably adding substantially to your production costs. For it is reliably estimated that eye accidents run to \$5 per shop worker per year.

It is also estimated (by the Society for the Prevention of Blindness) that 98 per cent of these accidents are avoidable—through the use of safety goggles.

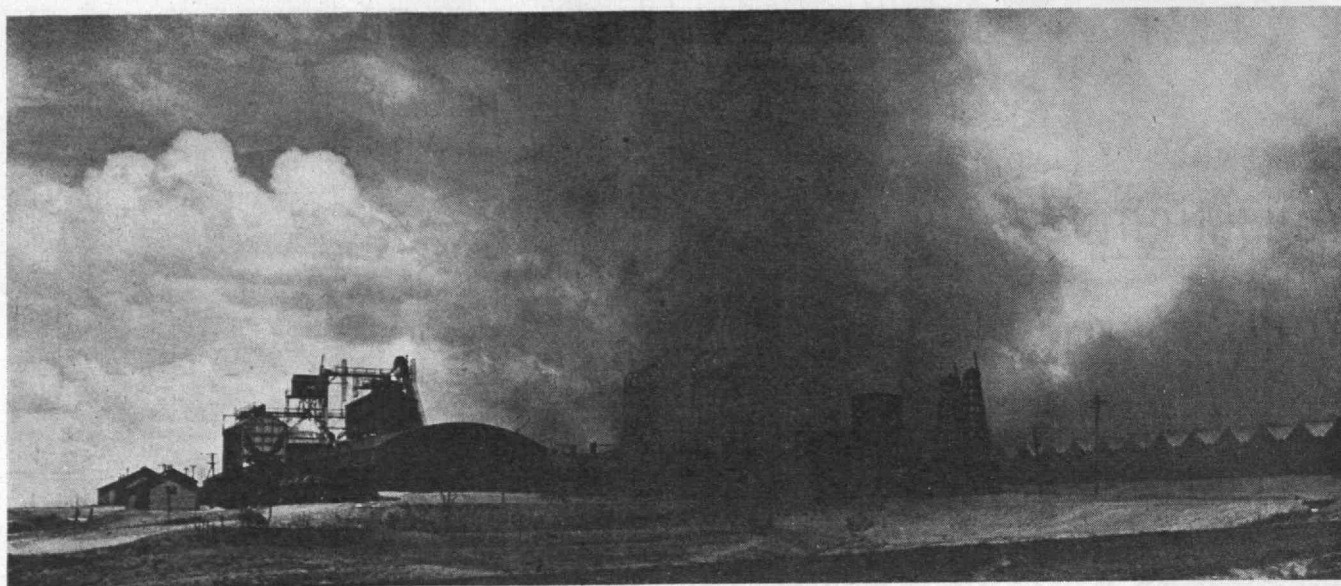
Why not let an AO Safety Representative make a complete eye-hazard survey of your plant? There's no obligation.

American  Optical

COMPANY

Safety Division

SOUTHBRIDGE, MASSACHUSETTS
BRANCHES IN PRINCIPAL INDUSTRIAL CITIES



FOR INDUSTRY

Carbon Black
Oil

Natural Gas

Natural Gasoline

Pumping Equipment

Pine Tar

Charcoal

Carotene

Chlorophyll

Products of the Cabot group of enterprises meet many of the essential needs of American industry. One of these products is Pro-Vitamin A, for the fortification of foods and feed-stuffs. Another is Chlorophyll, a coloring agent for soaps and other products. Still another use for Chlorophyll, in an entirely different field, is in the manufacture of air wicks. Chlorophyll also has very definite therapeutic values.

For the rubber industry, Cabot is the world's largest producer of SRF Carbon Black. Yet SRF Black is but one of the forty-one distinct grades of this important raw material produced by the Cabot organization for the rubber, ink, paint, varnish and lacquer industries.

All maintain the same high characteristics. In the manufacture of Carbon Black by the Channel process, for instance, Cabot established the standards by which all other Channel Blacks are judged. Emphasis always is on sustained high quality in all of the diversified Cabot production schedules.

CABOT CARBON CO.

TEXAS ELF CARBON CO.

GENERAL ATLAS CARBON CO.

CABOT SHOPS, INC.

VALLEY VITAMINS, INC.



GODFREY L. CABOT, INC.

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Are You Acquainted with the WHOLE Norton Family?

ABRASIVE PRODUCTS

Grinding wheels ranging from tiny internals 3/16 x 3/16" to the 72" diameter segmental type — wheels of Alundum[®], Crystolon[®] and diamond abrasives, of many different bonds; a wide variety of abrasive bricks, sticks, hones and segments; mounted points and mounted wheels in nearly 200 sizes and shapes; abrasive grain for polishing, lapping and tumbling.

NORBIDE[®]

"The hardest material made by man for commercial use" — that is NORBIDE, the trade name for Norton Boron Carbide. It is serving industry in three forms: (1) Norbide Abrasive for grinding and lapping carbide tools, and for lapidary work; (2) Norbide Molded Shapes for pressure blast nozzles and for plug, ring and other types of gages; (3) Norbide Metallurgical Compound for improving the hardness and cutting ability of tool steels and as a deoxidizing agent.

NORTON FLOORS

The hardness, toughness and abrasive properties of Alundum abrasive are made use of in NORTON FLOORS — Alundum Stair and Floor Tile, Alundum Ceramic Mosaic Tile and Alundum Aggregate for terrazzo and cement floors. They are for use in public and commercial buildings wherever it is necessary to provide floors and stairs with an extremely wear-resisting and permanently non-slip surface (wet or dry).

REFRACTORIES

The terrific heat of the electric furnaces, which produce Alundum and Crystolon abrasives also gives these materials valuable refractory properties — properties which are made use of in a complete line of Norton refractory grain, cements, bricks, plates, tiles and other shapes for metal melting and heat treating, for enameling furnaces, ceramic kilns, boiler furnaces, gas generators; also refractory laboratory ware for ignition, incineration and filtration.

OILSTONES AND COATED ABRASIVES

Oilstones and sharpening specialties in sizes and shapes to meet every need of the industrial worker, the farmer and the home craftsman; and abrasive paper and cloth in a wide variety of coatings and types for both industry and the home mechanic are available through the Behr-Manning Corporation of Troy, New York, Division of Norton Company.

GRINDING AND LAPPING MACHINES

Norton cylindrical grinders range from the neat, compact 4 x 12" Type C to the gigantic 36 x 816" Type D and include special types for grinding crankshafts, camshafts, rolls and car wheels. Norton surface grinders are available in three sizes, 6", 10" and 12". There are three Norton Tool and Cutter Grinders and the Norton Buraway. Lapping Machines range from the small 10-U to the large Hyprolap[®] for flat and cylindrical work, and include special machines for crankshafts and camshafts.

PULPSTONES

Norton ingenuity developed for the pulp and paper industry a line of segmental stones running as large as 72 x 54" and weighing up to ten tons — stones that convert the logs of the forest into wood pulp for newspaper, wall paper, towels, toilet tissue, cartons, wall board, paper plates and countless other uses.

POROUS MEDIUMS

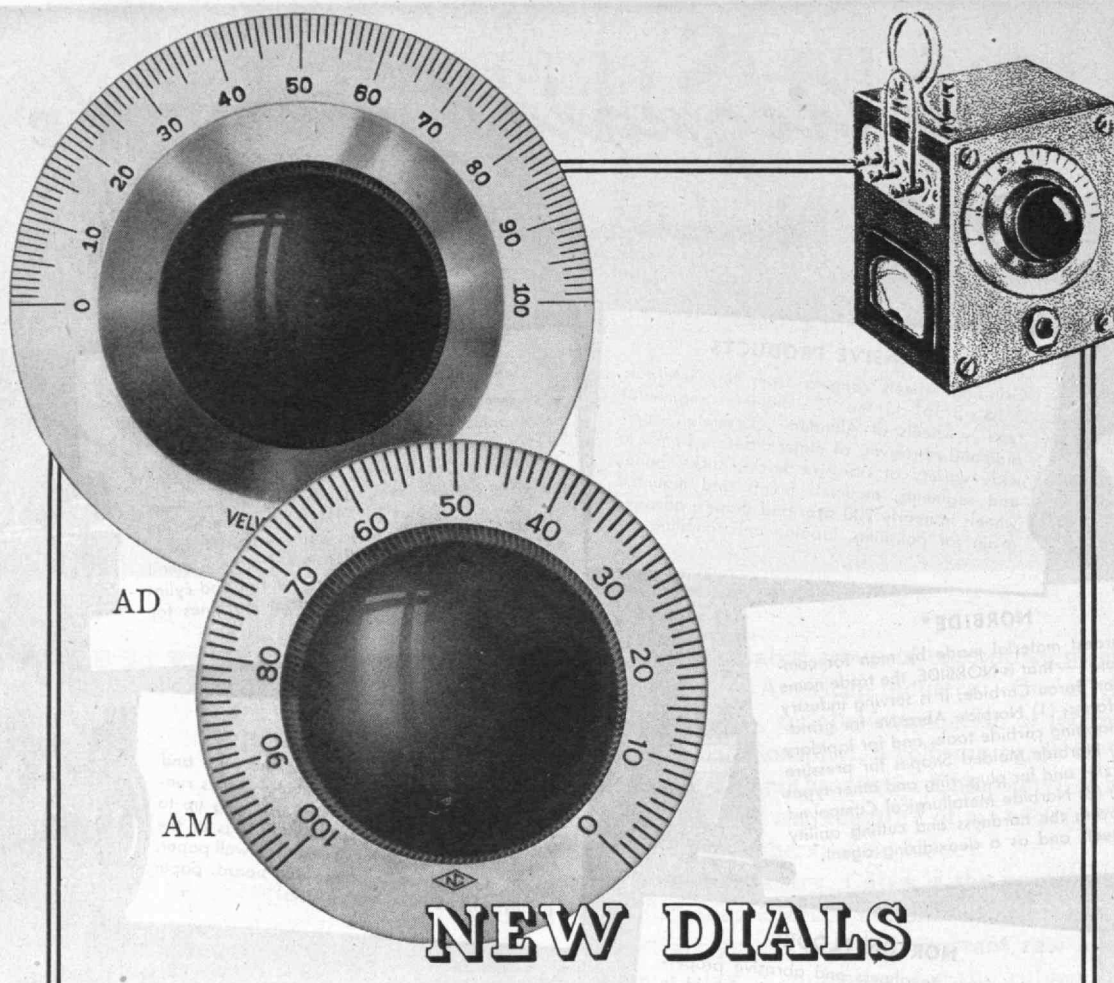
Norton Porous Mediums are made in a wide variety of shapes and rates of permeability for the aeration, filtration and diffusion of liquids, solids and gases. Important uses are in activated sludge sewage disposal plants, for municipal water filtration plants and in many commercial filtration and aeration processes.

Informative literature in any or all of these Norton products available on request — also Norton engineering service. Write today.

* Trade-marks registered U. S. Patent Office

**NORTON COMPANY
WORCESTER 6, MASS.**

NORTON



NEW DIALS

Wartime requirements for accurate smooth-working dials resulted in the design of these two new models. Both make use of the time-tested "Velvet Vernier" drive unit which for more than twenty years has been a favorite because of its incomparably smooth action and sensitive control. The Type AM Dial is three inches in diameter and is available with 2, 3, 4, 5 or 6 scale. The four-inch Type AD Dial is made with 2, 3, 4 or 5 scale. Both are handsome in appearance and moderate in cost.

DIAL SCALES			
Scale	Divisions	Rotation	Direction of Condenser Rotation for increase of dial reading
2	0-100	180°	Counter Clockwise
3	100-0	180°	Clockwise
4	150-0	270°	Clockwise
5	200-0	360°	Clockwise
6	0-150	270°	Counter Clockwise



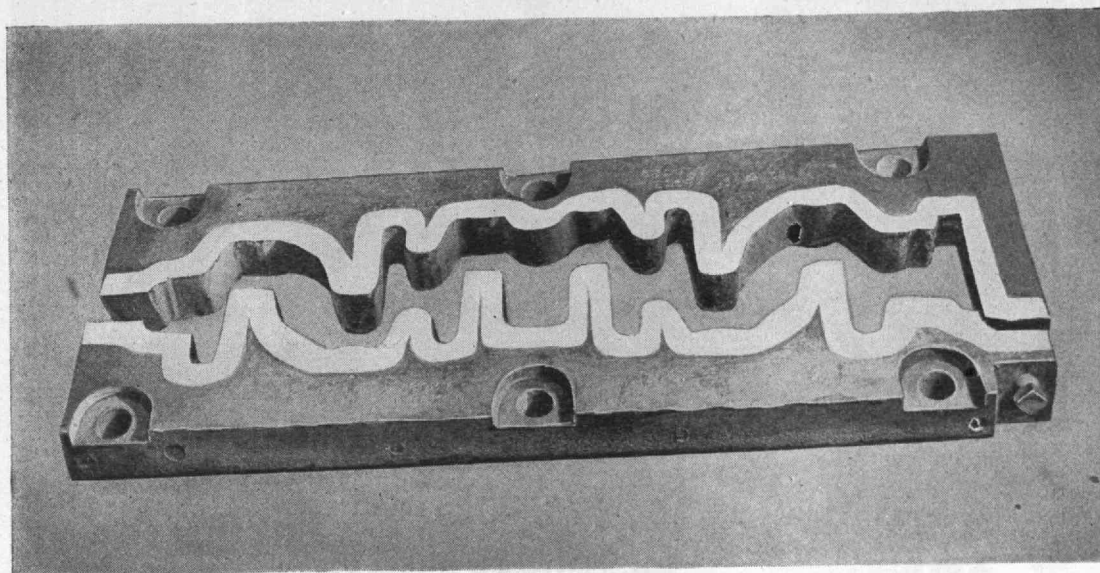
NATIONAL COMPANY,



INC., MALDEN, MASS. U.S.A.

HAYNES STELLITE

*Makes Dies Last Longer
and Saves Refitting Time*



This crankshaft trimming die is hard-faced at points of wear with HAYNES STELLITE. It trimmed from 150,000 to 155,000 pieces before it was returned to the die shop for touching up. Before the practice of hard-facing these trimming dies was adopted, they produced less than 500 pieces before it was necessary to refit them.

HAYNES STELLITE increases the life of all types of dies because it resists abra-

sive wear even on hot work. Maintenance costs are reduced—as dies have to be changed less frequently, and, also, you can refit a hard faced die in less time than is required for refitting a plain steel die.

For further information on savings that can be made by hard-facing with HAYNES alloys, write for the 100-page book, "Hard-Facing With Haynes Stellite Products."

HAYNES STELLITE COMPANY

Unit of Union Carbide and Carbon Corporation



General Offices and Works, Kokomo, Indiana
Chicago—Cleveland—Detroit—Houston—Los Angeles—
New York—San Francisco—Tulsa

HAYNES

TRADE-MARK

Alloys

The registered trade-marks "Haynes" and "Haynes Stellite" distinguish products of Haynes Stellite Company.

with

**PENFLEX FLEXIBLE METALLIC INTERLOCKED
GALVANIZED STEEL HOSE, BRONZE
STEAM HOSE**



you get

ALL-METAL SAFETY with **FLEXIBILITY** for
your **TANKS, VATS, PROCESSING EQUIP-
MENT** and **PIPE SYSTEMS**

PENFLEX—Four-wall Interlocked gives you high resistance to wear, absorption and fire. It is vibration-absorbing . . . severe pulsations of pressure and frequent flexure do not affect its useful life. Four-wall Interlocked construction provides a combination of great strength and flexibility, yet *the metal itself does not bend* . . . the hose remains tight. Full flow area is always maintained; this hose cannot collapse.

AVAILABILITY—**PENFLEX GALVANIZED STEEL HOSE** — for oil, grease, hot tar, paint, gas, air or any other free-flowing material or liquid. Fire-resistant. Has inherent electro-static protection. Is easy to handle. Resists vibration and high temperatures. Is strong and flexible.

PENFLEX BRONZE HOSE—for water or steam, and for many types of application on processing equipment. Has all of the advantages of galvanized steel and is resistant to corrosive action. **NOTE:** Also available in various alloys.

For engineering data on **PENFLEX GALVANIZED STEEL, BRONZE HOSE** and **COUPLINGS**—write for Bulletin 52-9.

THREE BASIC TYPES—STANDARD FOUR-WALL INTERLOCKED

—for heavy duty service. Interlocked construction provides maximum strength with simple construction.

TYPE HR HIGH RIDGE—medium duty hose. High ridge joint affords greater relative motion between corrugations than does the Standard Four-wall Interlocked.

TYPE FP LIGHTWEIGHT—most flexible hose. An extremely flexible construction with lubricated packed joints.

All of the three types can be reinforced by the addition of braiding and armor.

PENFLEX COUPLINGS—Available in two types

SOLDERED-ON TYPES for use at temperatures to 250 degrees Fahrenheit and **HEAT-PROOF TYPES** for temperatures above 250 degrees Fahrenheit.

Both types can be supplied in brass or malleable iron . . . plain or reinforced.

PENFLEX SALES COMPANY

DIVISION OF THE

PENNSYLVANIA FLEXIBLE METALLIC TUBING CO.

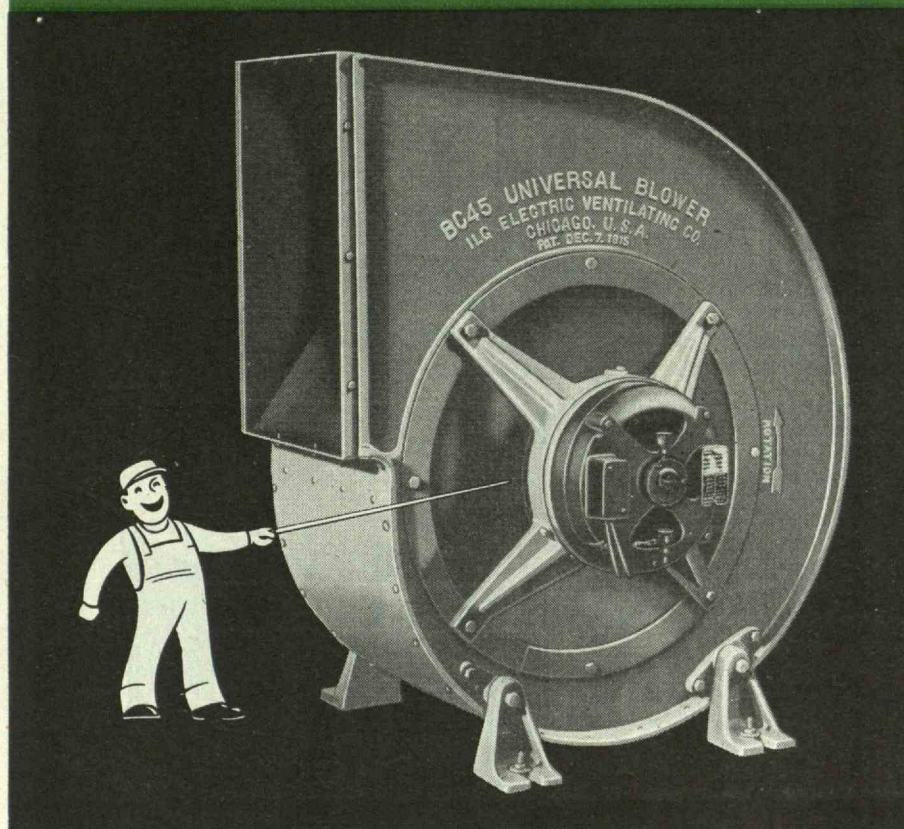
Established 1902

7215 POWERS LANE

PHILADELPHIA 42, PA.

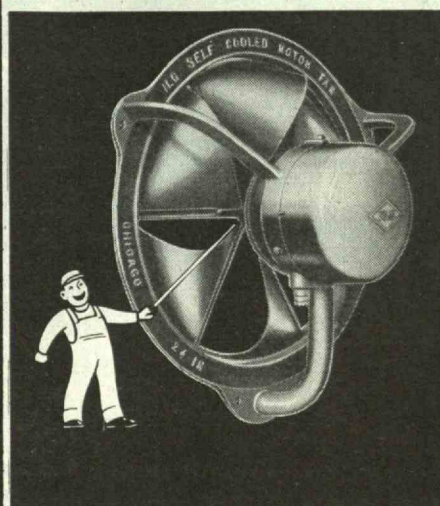


ILG *DIRECT DRIVE* REDUCES YOUR LABOR COSTS!



Direct-Drive
Centrifugal Fans

Direct-Drive
Self-Cooled Motor Propeller Fans



Sharply advancing labor costs can be offset to a great extent by specifying *direct-connected* ventilating and heating apparatus! There is no time-wasting alignment necessary . . . no belts or pulleys to increase labor on the job . . . no special motor bases to require extra work . . . no belt or chain guards to buy and install . . . no extras to knock down profits!

And, in addition, you give each job the best possible equipment—you save space, you have permanent alignment (no rapidly wearing parts),

you avoid shutdowns for replacements or servicing of parts, you eliminate power-wasting friction and noise, and your equipment delivers its full rated capacity!

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"An Engineer Looks at ILG" is title of new 36-page picture book . . . specially prepared to interest men who design, specify, or install equipment. Get yours now.



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AND AIR CONDITIONING

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2860 North Crawford Avenue, Chicago 41, Ill.
Offices in 40 Principal Cities

POSITIVE CONTROL

of Varying Power Supply

Raytheon Voltage Stabilizers

DELIVER OUTPUT VOLTAGE CONSTANT TO $\pm \frac{1}{2}\%$

FLUCTUATION of line voltage need not impair the performance of your electrical equipment. Such variations are easily corrected with magnetic-type, entirely automatic Raytheon Voltage Stabilizers.

Positive control is gained. Power supply is stabilized to $\pm \frac{1}{2}\%$. Reliability and accuracy of performance are effectively improved, *and at low cost.*

Investigate. Determine how positive control of line voltage can benefit your equipment. Our Bulletin DL-48-537 gives the detailed story. Write for it today.



CASED MODEL

Get These Principal Operating Advantages:

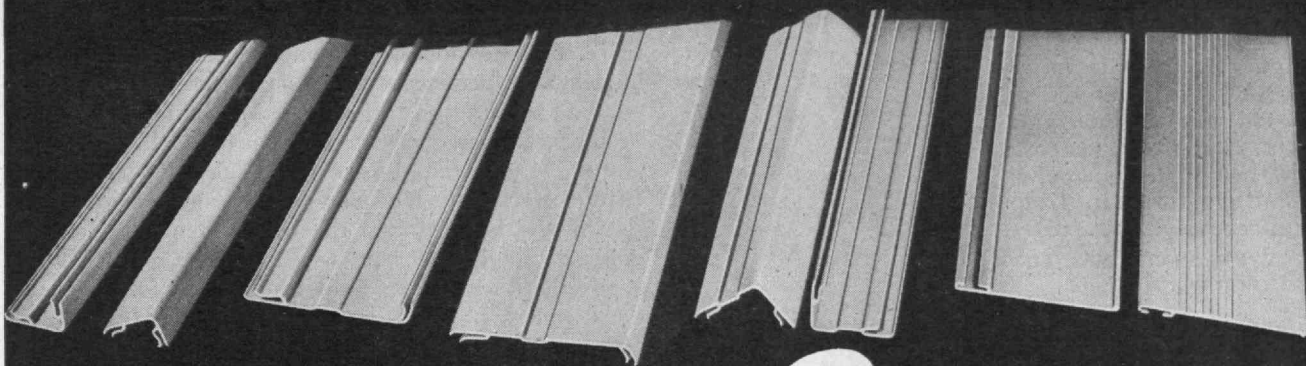
- Control of output voltage to within $\pm \frac{1}{2}\%$ of 115 or 230 V.
- Stabilization at any load within rated capacities.
- Quick response. Stabilizes varying input voltage within 1/20 second.
- Entirely automatic. No adjustments. No moving parts. No maintenance.

RAYTHEON

RAYTHEON MANUFACTURING COMPANY
Industrial Electronics Division, Waltham 54, Mass.

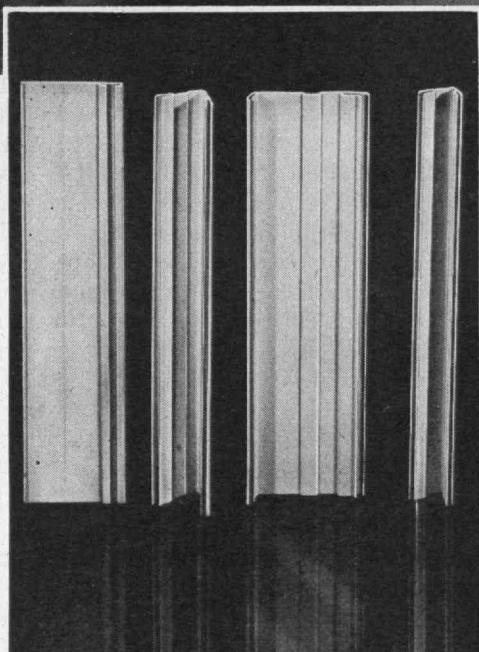
Excellence in Electronics

REFRIGERATOR BREAKER STRIP SECTIONS



EXTRUDED BY...

Sandee



THE ACCEPTED MATERIAL FOR BREAKER STRIPS

Plastics have long been the accepted material for breaker strips. Modern trends, however, demand better functioning and better looking sections.

The refrigerator breaker strip sections shown above illustrate another milestone in Sandee's development of sound industrial applications for plastics.

Sandee, in close cooperation with several leading refrigerator manufacturers, has developed a number of better custom extruded snap-on breaker strips. Among other superior advantages they 1. greatly decrease assembly time, 2. eliminate unsightly screws, and 3. provide a pleasing contour to blend into general cabinet design. Available in white or appealing, contrasting, pastel tones.

Again, our technical personnel can offer you the benefits of successful experience in the development of individual refrigerator parts as well as for other sound industrial applications.

SALES REPRESENTATIVES IN 19 PRINCIPAL CITIES

Sandee Manufacturing Company

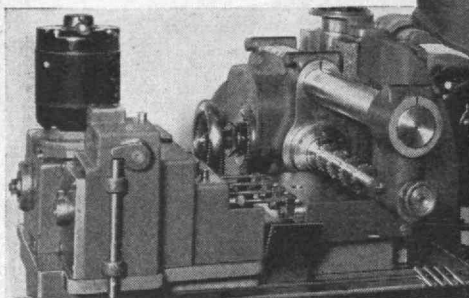
3945 NORTH WESTERN AVENUE • CHICAGO 18, ILLINOIS

EXTRUDED PLASTICS AND SPECIAL TOOLS

IMPROVE PRODUCTION ON SMALL PARTS MILLING

Adaptable to a wide variety of work-holding fixtures, the No. 000 enables manufacturers to cut milling costs. View below shows a set-up for milling flutes in 4 taps simultaneously.

BROWN & SHARPE MFG. CO.
Providence 1, R. I.



**No. 000
PLAIN
MILLING
MACHINE**
*Details on
request.*



BROWN & SHARPE



Reg. U. S. Pat. Off.

Samson Cordage Works

Boston 10, Mass.

Manufacturers of braided cords of all kinds, including sash cord, clothes line, trolley cord, signal cord, shade cord, Venetian blind cord, awning line, etc., also polished cotton twines and specialties.

SPOT CORD

Reg. U. S. Pat. Off.



Our extra quality sash cord, distinguished at a glance by our trade-mark, the colored spots. Especially well known as the most durable material for hanging windows, for which use it has been specified by architects for more than half a century.

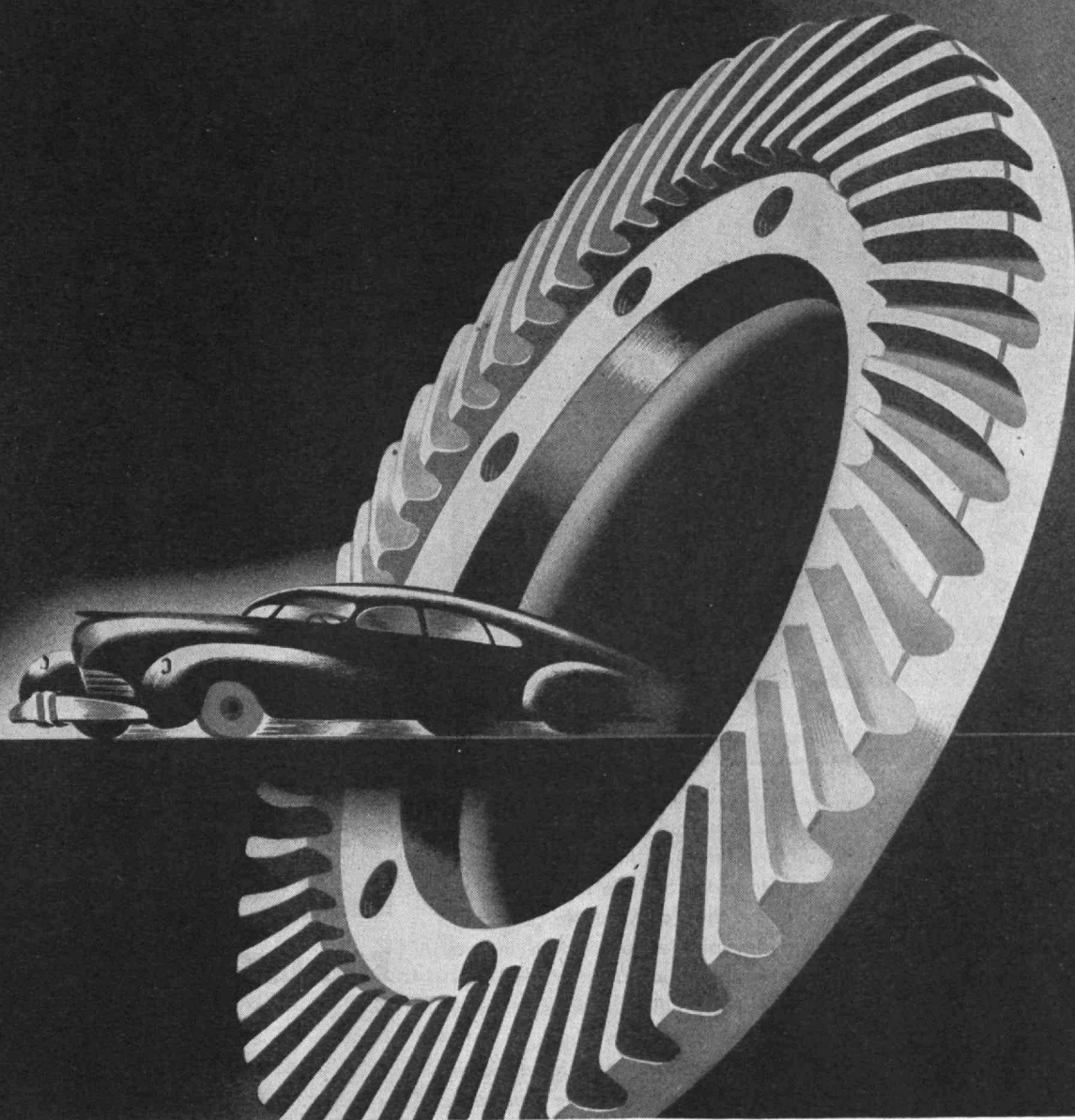
THE TABULAR VIEW

Airport Design, assuming increasing importance as air travel becomes more commonplace, has suffered from inadequate planning to meet the needs of a rapidly expanding air transportation system. A study of current problems in airport design is given (page 481) by A. J. BONE, '24, Associate Professor of Highway Engineering. After receiving his bachelor's degree and serving as assistant and instructor in the Department of Civil and Sanitary Engineering at the Institute, Professor Bone engaged in the design of roads and utilities for large land development projects. He returned to the Institute in 1933 as instructor in civil engineering. In 1936 he received the master's degree and was advanced to assistant professor of highway engineering. In 1945 he was promoted to associate professor. . . . ¶ Recognizing the growing importance of air transportation, Professor Bone expanded instruction in transportation engineering to include airport design and construction and developed new courses in airport design. His principal interests are highway economics, traffic engineering, and air transportation. He initiated the First New England Traffic Engineering Conference, held at M.I.T. in 1941 in co-operation with the Massachusetts Department of Public Works. The success of this meeting led to a second conference in 1944, and this June, M.I.T. will be host to the third conference. . . . ¶ Professor Bone was a member of the M.I.T. committee, appointed in 1941, to study the development of Boston's airport. For the past three years he has been engaged in a comprehensive study of all phases of air transportation. His professional papers deal with such topics as highway accidents, highway design, traffic delays, and highway economics.

Discriminating Particles and Working Bubbles work harmoniously in flotation processes to achieve separation of mineral crudes. In early attempts at flotation, extensive use was made of oil as the flotation agent, but A. M. GAUDIN, Richards Professor of Mineral Dressing at M.I.T., records (page 491) progress in which air and other gases have replaced oil. . . . ¶ Professor Gaudin comes from a distinguished French family. For many years his paternal grandfather, Marc-Antoine C. Gaudin, was secretary of the Academy of Sciences in Paris; his father was a civil engineer and general manager of a French owned railroad in Turkey. . . . ¶ In 1917 Professor Gaudin completed requirements for his bachelor's degree from the University of Paris and in the same year entered Columbia University, from which he received the degree of engineer of mines in 1921. In 1918 he enlisted in the United States Army and served until shortly after the armistice was signed. In 1924 he was invited to become lecturer in mining at Columbia University, where he remained until 1926, when he accepted appointment as associate professor of metallurgical research at the University of Utah. Three years later he was appointed to the staff of the Montana School of Mines, where he remained 10 years. In 1939 he came to M.I.T. as Richards professor of mineral dressing. . . . ¶ Professor Gaudin completed his reference book, *Flotation*, in 1932.

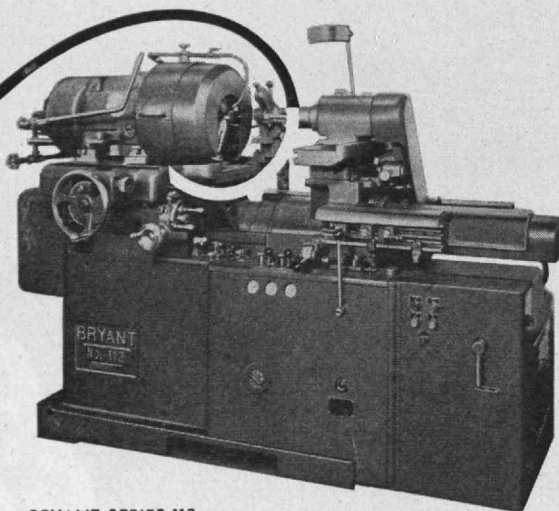
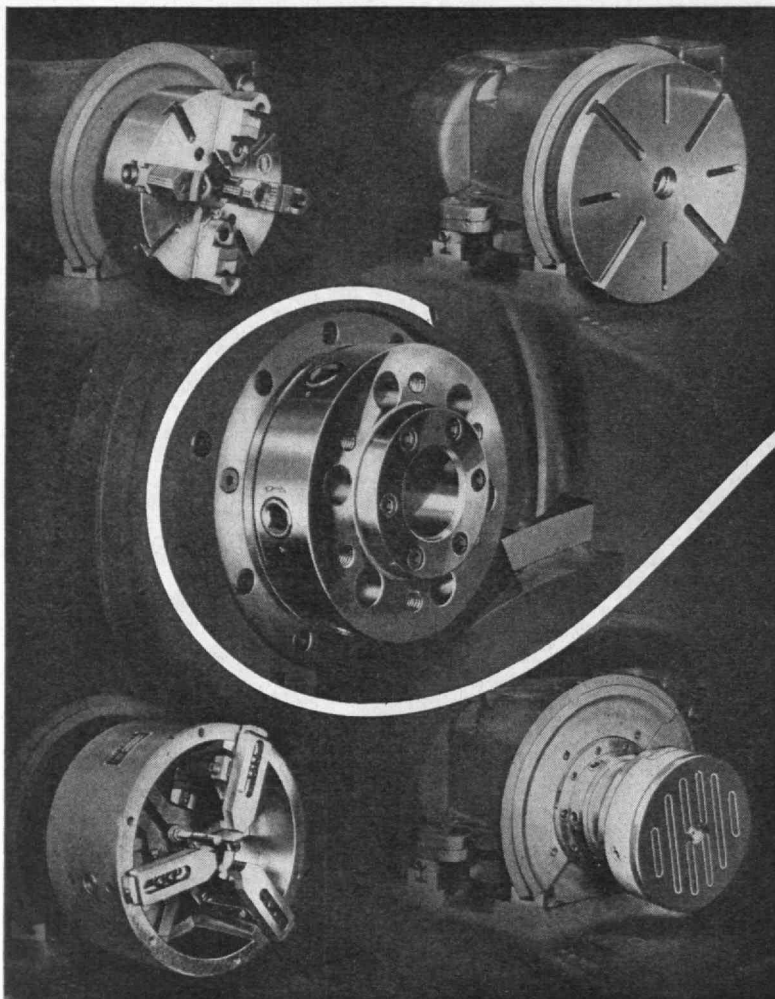
(Concluded on page 470)

Molybdenum in steel is an answer to impact requirements—hardenability is improved and temper brittleness practically eliminated.



MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"
CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

Climax Molybdenum Company
500 Fifth Avenue • New York City



BRYANT SERIES 112

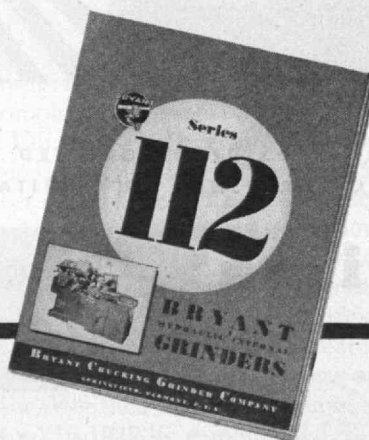
● MINIMIZES SETUP TIME ON TOOL ROOM WORK

Holding fixture changes in less than 2 minutes? . . . You can on the Bryant Series 112 Hydraulic Internal Grinder. This modern tool room grinder is equipped with an American Standard Spindle Nose with the quick-change cam lock feature. This means that (a) Accurate centering is provided by the tapered pilot on the spindle nose fitting into a tapered recess in the back of the chuck, (b) Squareness of mounting is obtained by the ground face in the back of the chuck registering against the ground face of the spindle nose, (c) The chuck is held rigidly in position by the locking cams in the spindle nose which engage the cam locking studs in the back of the chuck, and (d) The cam lock feature also provides a quick means of mounting and unmounting the chuck. A clockwise, one-quarter turn of the wrench on each locking cam is sufficient to lock the chuck securely.

You will find important tool room features like this at every point of the Bryant Series 112 machines. It all adds up to less down time, more accurate work, finer work finish and fast production.

For complete details — Send for the Man from Bryant.

CAM LOCK FOR INTERNAL GRINDING



Write for big new catalog which describes this machine in detail ➤

BRYANT



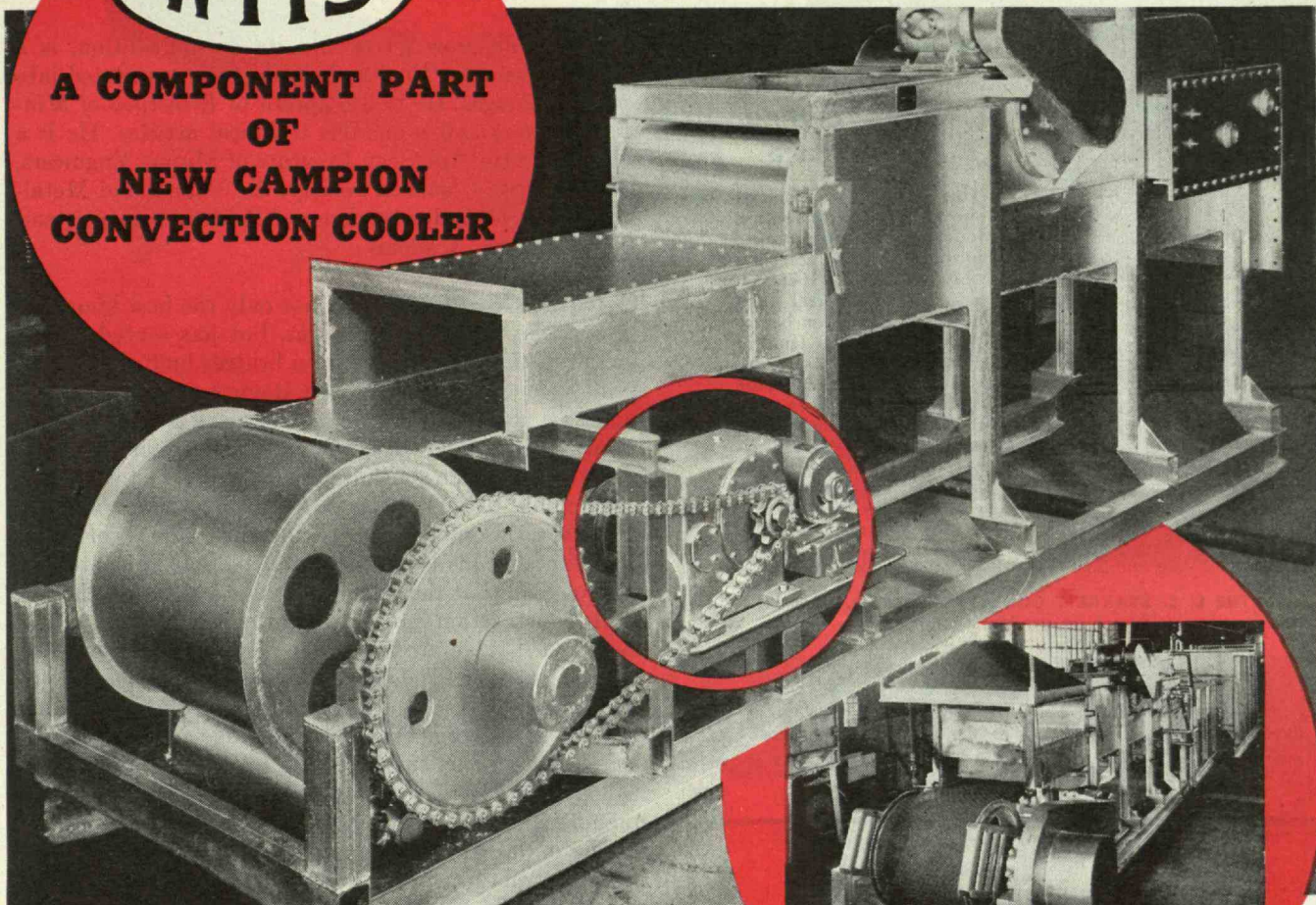
BRYANT CHUCKING GRINDER CO.

SPRINGFIELD, VERMONT, U. S. A.

WHS

**A COMPONENT PART
OF
NEW CAMPION
CONVECTION COOLER**

WHS SPEED REDUCER AT WORK!



(At Right)
**NEW CAMPION CONVECTION
COOLER APPLIED TO CON-
TROLLED ATMOSPHERE
FURNACE**



Have you a copy of our pocket-size Catalog covering the entire WHS line and including a valuable engineering section? Ask for Catalog No. 145.

A stock model 6DB WHS Worm Gear Speed Reducer, ratio 1500 to 1, is a standard component of the conveyor drive of the new Campion Electrically Heated Controlled Atmosphere Furnace. This furnace can be used for (1) brazing and (2) bright annealing.

Campion's reliance on WHS Speed Reducers is further recognition of the unvarying **DEPENDABILITY** of these units. Dependability . . . extreme durability . . . and economy are WHS qualities that have led to their adoption in well over 100 important industries. They are made by the manufacturers of "the First Reducers in America to be Shipped from Stock".



1901-1946 — 45th ANNIVERSARY

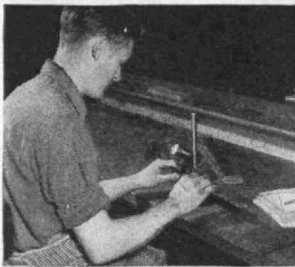
Cutter P. Davis, M. I. T. '19, President



WINFIELD H. SMITH, Inc.

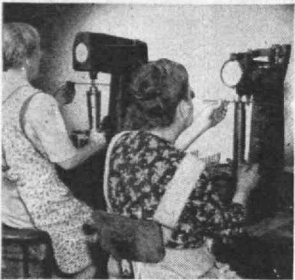
55 MAY STREET... **SPRINGVILLE** .. ERIE COUNTY .. **NEW YORK**

HOW THE
"WORLD'S GREATEST TOOLMAKERS"
 CHECK EVERY
STARRETT HACKSAW AND BAND SAW



**To Insure Greater
 Uniformity and
 Superior Cutting
 Performance**

The precision gaging tests shown at the left (checking tooth set and spot testing for uniform hardness) are only two of many between selection of the steel stock and final inspection before packaging in the familiar Starrett red boxes. Once you select the right blade or saw for your jobs from the complete Starrett line, you know that you can expect the same fast-cutting, long-lasting performance with each re-order. Be sure to specify Starrett hacksaws and band saws.



THE L. S. STARRETT CO., ATHOL, MASS., U. S. A.
 WORLD'S GREATEST TOOLMAKERS

STARRETT

PRECISION TOOLS • DIAL INDICATORS • STEEL TAPES • HACKSAWS
 METAL AND WOOD CUTTING BAND SAWS • GROUND FLAT STOCK

**BATH
 IRON WORKS
 CORPORATION**

*Shipbuilders and
 Engineers*

BATH, MAINE

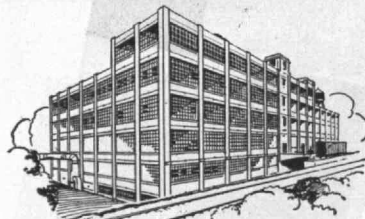
THE TABULAR VIEW

(Concluded from page 466)

This volume, now going into its second edition, is a standard work in English and has been translated into other languages. He is also author of *Principles of Mineral Dressing* and numerous technical articles. He is a member of the American Institute of Mining Engineers, the American Chemical Society, the Mining and Metallurgical Society, the Academy of Political Sciences, and the New York Academy.

High Road to Brooklyn is not only the best known of present-day suspension bridges, but has served as the prototype for many suspension bridges built during the past six decades. Last month Review readers were acquainted with the social and engineering conditions confronting the builders of the Brooklyn Bridge in the 1870's and 1880's. In the concluding part of this historical and engineering article (page 487), E. H. CAMERON, '13, discusses the pioneering engineering efforts of John Roebling and his loyal assistants. . . . It is interesting to recall that the safety measures and the method of cable construction in use during the construction of the Brooklyn Bridge are fundamentally those employed at the present time. To lend proper perspective, features of the Brooklyn Bridge are compared with corresponding data for the George Washington Bridge across the Hudson. The two-part survey of the Brooklyn Bridge, published in *The Review*, is a condensation of a much longer manuscript prepared by Mr. Cameron in pursuit of his hobby of unearthing historical data of well-known engineering structures. . . . Since his graduation from the Institute, Mr. Cameron has had extensive engineering experience in the design, construction, and engineering supervision of projects in New England, the Middle West, and the South as engineer for Jackson and Moreland. During the war Mr. Cameron organized the technical publications staff of Jackson and Moreland, which he continues to head.

**Speed with
 Economy**



Allied Products Co., Inc.

Speed can be had with *quality* — it's all in knowing how. We've been doing it for 29 years on all types of industrial projects. Our buildings stand inspection.

W. J. BARNEY CORPORATION

101 PARK AVENUE, NEW YORK
INDUSTRIAL CONSTRUCTION

Alfred T. Glassett, '20, Vice President

LEADERSHIP BASED ON ACCOMPLISHED FACTS

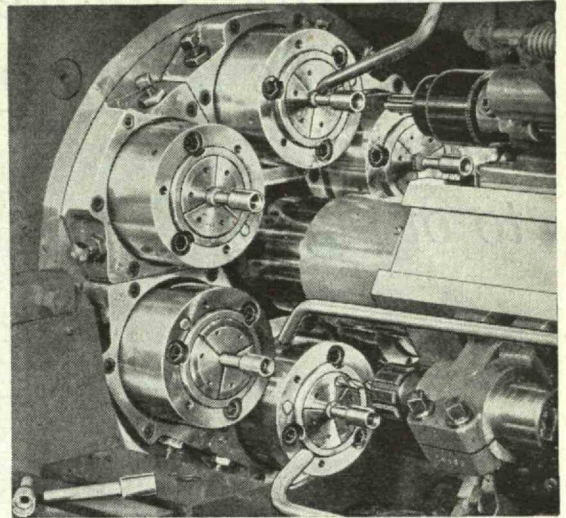


**SUCCESS
STORY
"BANTAM SIZE"**

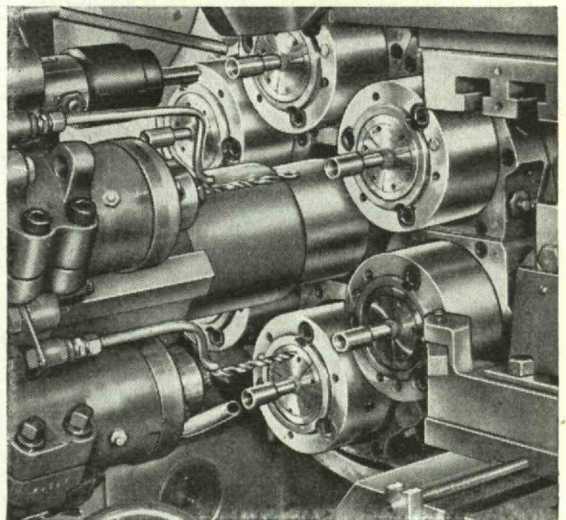
This will interest you if your work involves small accurate parts. In tooling and equipping our Model 65 Six Spindle Automatic Chucking Machines for the requirements of the Moeller Instrument Company, Richmond Hill, New York, provision was made for handling a variety of sizes of similar parts in various metals including steel, nickel copper alloy, and naval brass forgings.

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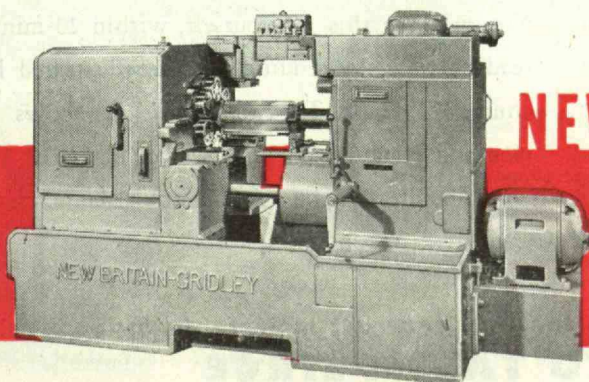
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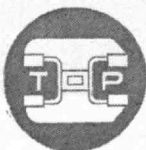
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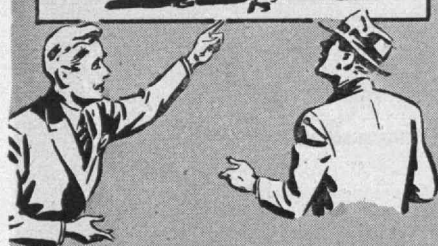


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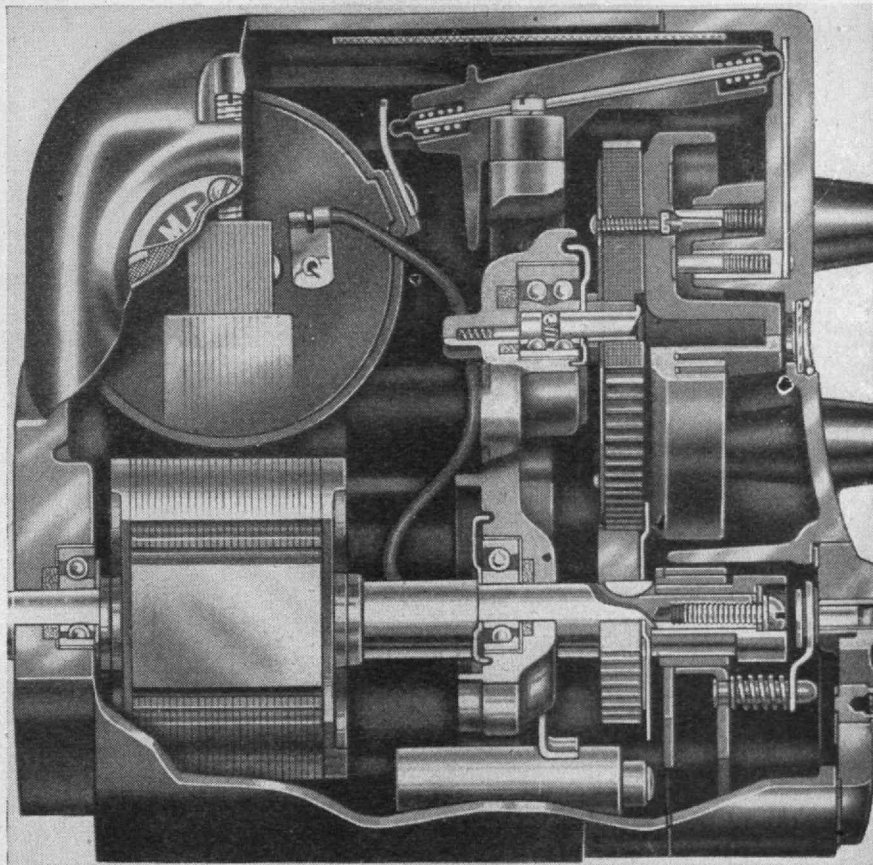
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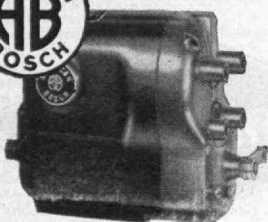
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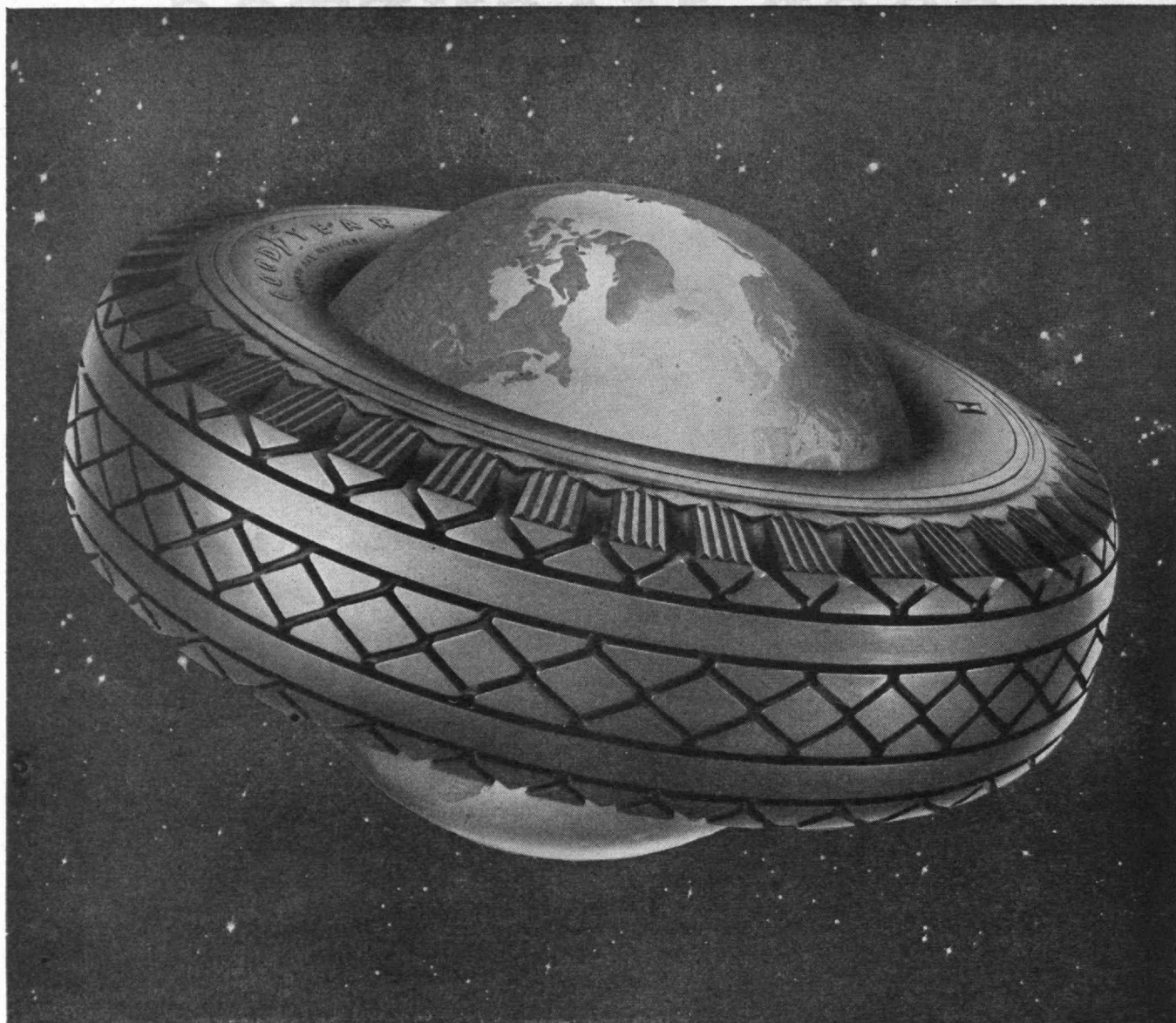
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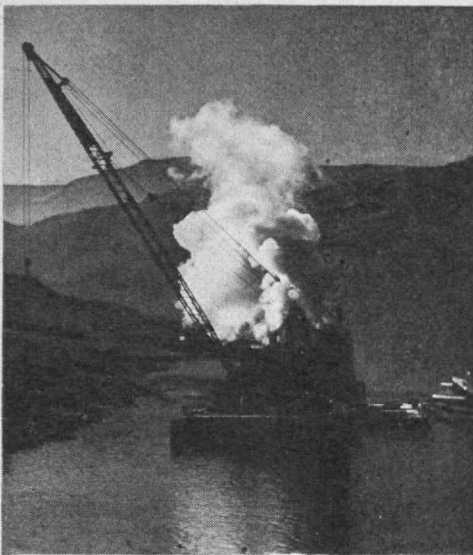
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U. S. Bureau of Reclamation

Construction at Coulee Dam

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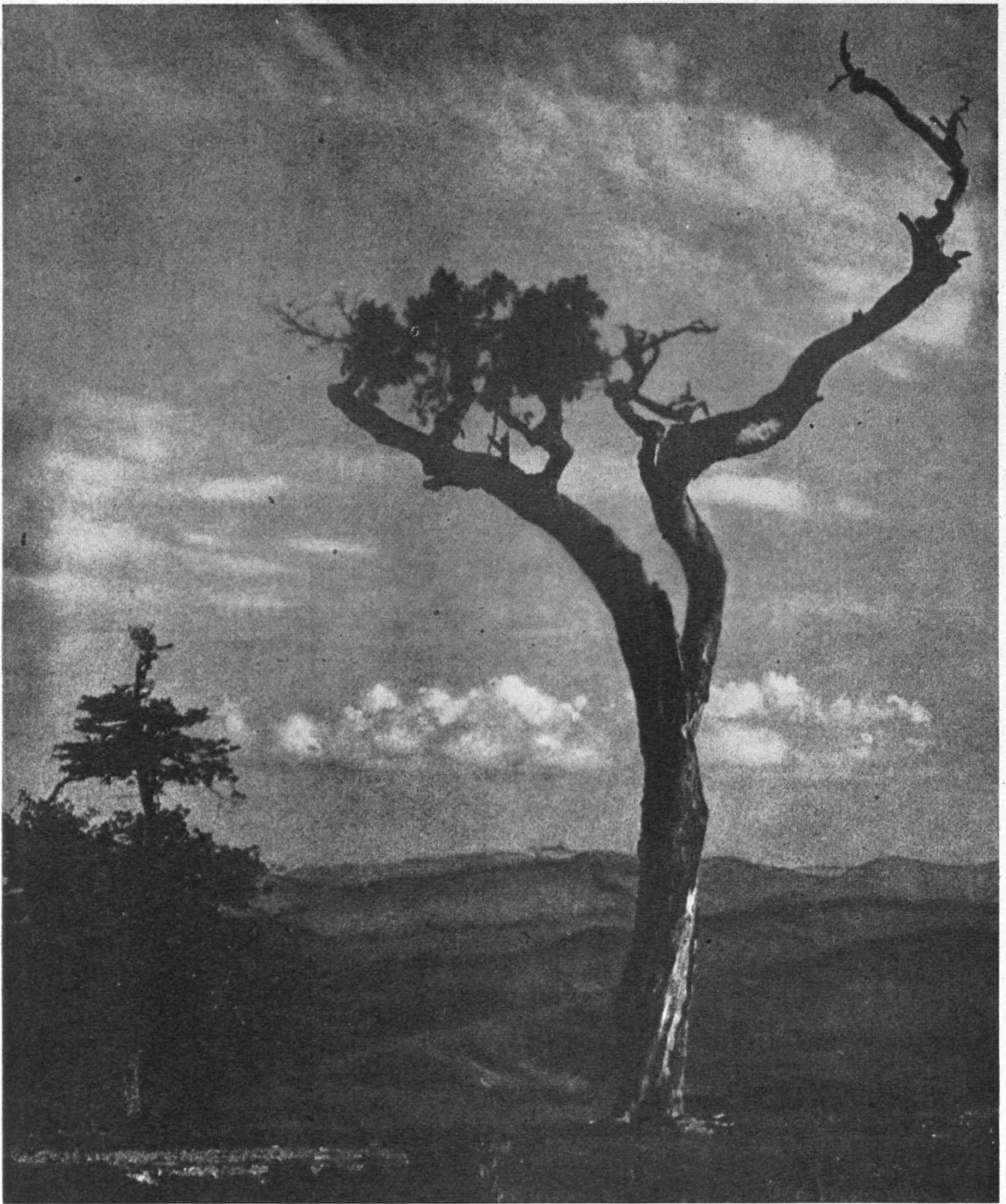
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Guardian of the Hills

From a photograph recently exhibited at the Massachusetts Institute of Technology gallery

THE TECHNOLOGY REVIEW

Vol. 48, No. 8



June, 1946

The Trend of Affairs

More Light

A NEW type of electric lamp, producing a dazzling light, one-sixteenth as bright as that of the sun, is one of the results of war research which hold promise for many peacetime applications. Like fluorescent tubular lamps and other new light sources, the lamp — a concentrated arc — must be used in suitably designed circuits and cannot be interchanged with present-day lamps. Recently described by W. D. Buckingham and C. R. Deibert of the Western Union Telegraph Company in a paper presented before the Optical Society of America, the lamp has a number of interesting characteristics which make it well adapted for certain technical uses.

Basically, the light is an arc lamp provided with permanent electrodes sealed into a glass bulb which is filled with an inert gas at atmospheric pressure. Light is produced at an incandescent spot which forms on a specially prepared zirconium oxide cathode. The oxide surface is raised to its melting point by bombardment of ions. A brilliant white light is emitted by this molten surface and by the zirconium vapor and inert gas within the tube. Radiation is produced in the ultraviolet, visible, and infrared regions of the spectrum.

The luminous circular spot is about 0.003 inch in diameter for the two-watt lamp and about 0.06 inch in diameter for the 100-watt lamp, but the spot size varies with the current through the lamp. The concentrated arc thus provides a closer approach to a point source than do other forms of commercially available illuminants and makes them especially suitable for narrow-beam and high-intensity projection and illumination applications.

Concentrated arc lamps operate on direct current and are started with a high voltage that breaks down the gas in the lamp. The alternating current type is frequently started without the use of high voltages by the aid of an auxiliary tungsten filament, which is built into the lamps to furnish the initial ionization required to establish the arc.

At present, an anticipated use for the new light source is as an illuminant for microscopes. For photographic printing and enlarging the white spectrum is particularly useful in color photography. As a high-intensity source of ultraviolet radiation, the lamp may also have extensive application in the medical field. In large sizes the lamps are suitable for use in home and theater motion-picture projectors.

Synthetic Aim

THE intensive development of training devices proved to be one of the most interesting educational features of the war and one of the most promising peacetime educational aids. It was conclusively proved in many instances that manual capacity and operational ability could be advanced rapidly and efficiently by means of devices simulating actual field conditions. In its capability for developing proficiency under field conditions, the training device proved superior, in some cases, to practice on the instrument it was designed to simulate. In general, this superiority was the outcome of the ability to control training conditions and to tabulate and analyze results.

In anti-aircraft tracer fire from small caliber guns under field conditions, for instance, the gunner does not know whether or not he is scoring hits until enough hits have been made to bring down his target. In practice work for this kind of gunnery, the gunner fires at a sleeve towed by an airplane. Neither he nor his instructor knows when, if ever, his aim is accurate. The only information obtainable is the number of holes in the sleeve after the airplane lands. Such information fails completely to tell the gunner when his aim is right and when wrong, but a training device actually simulating field conditions can be designed to indicate instantly when the gunner's aim is correct.

A tremendous impetus was given to all such devices by our woeful lack of many important weapons at the start of the war. Ammunition could not be spared for practice,



Standard Oil Co. (N. J.)

and consequently some substitute had to be found for training men without the waste and uncertainty of field practice. The experience obtained under war pressure established the great value of training devices as first-rate educational tools.

One of the most interesting, and certainly the most spectacular, of such devices was the Mark I machine-gun trainer developed by the Polaroid Corporation for the Navy. With one exception this device simulated completely the conditions of anti-aircraft machine-gun fire; only the smell of gunpowder was lacking. The device consisted of an elaborate mechanism for projecting three-dimensional motion pictures of attack flights on a screen 20 feet wide and means for firing spots of light at a target with a firing angle of about 50 degrees.

The gun of the trainer sounded like a real gun, kicked like one, and "fired" spots of light on the screen which, when viewed stereoscopically, simulated actual tracer bullets that appeared to follow the normal trajectory of a real gun. The entire illusion, so far as the gunner was concerned, was exactly like field conditions, with the additional important feature that hits and misses were numerically recorded. Furthermore, a sound signal was given each time a bullet leaving the gun was destined to hit the target. Thus the gunner knew when his lead was correct.

A common experience with this device was that, after their first real combat, gunners would again and again apply for further practice on the trainer, insisting that it was superior to actual combat fire as a training device. The rate of hits on the device went up very rapidly with practice.

In all parts of the country many of these trainers were in continual operation at least eight hours a day and in some cases as many as 16.

Since the machine fired 720 shots a minute, each spot of light serving to replace an 8-cent bullet, the saving in ammunition was enormous. It has been estimated that all the Mark I trainers fired an equivalent of at least \$2,000,000 worth of ammunition a week. The technical problems involved in the design of such a super gadget were fascinating and unorthodox, taxing the ingenuity of many expert gadgeteers.

Unquestionably, many of these devices can be converted to peacetime classroom uses. Furthermore, they have established the value of and pointed the way toward the development of many similar devices for peacetime training pursuits.

Electrons Aplenty

SINCE the heart of any electronic device is an electron tube, the operation of which depends upon the behavior of free electrons, it follows that the ultimate source of electrons—the electron-emitting cathode of such tubes—occupies a strategic place in modern communications and industrial electronics. Pre-war techniques in the use of tubes made use of a constant stream of electrons, "boiled off" from a heated filament or a metallic surface heated electrically to incandescence. Instead of a constant stream of electrons, the development of radar and other pulsed techniques during the war required intermittent bursts of electrons of a few microseconds duration, repeated at rates of about a thousand times a



Ewing Galloway, N. Y.

second. Not only was the duty cycle completely changed, but the peak demand was many times that required for pre-war electron tubes. Thus, the rigorous demands of wartime developments necessitated improved types of electron-emitting cathodes.

For many years one of the most popular types of cathodes for small tubes has been a filament or metallic tube of nickel, platinum, or other high-melting metal, coated with barium and strontium carbonates. When properly processed and heated to dull red heat, the carbonates break down to oxides, and the coated cathodes are then capable of producing a plentiful supply of the much-needed free electrons. It was discovered that the oxide-coated cathodes had a plentiful reserve power, so that instead of providing current densities of only a few milliamperes per square centimeter under continuous operation, current densities of several amperes per square centimeter could be obtained in the required intermittent bursts. This reserve property has allowed the development of new tubes for radar purposes which are capable of producing a million watts of power in short pulses, with a tube of such size as can be easily held in one hand. Although the peak power is tremendously high, by pre-war standards, the average electron emission is not greatly increased, for the tube is called upon to supply electrons for only a small fraction of the time.

One group at the Radiation Laboratory devoted full attention to problems of research and design of cathodes for tubes for wartime pulsed technique applications. In carefully prepared tubes, electron emission of as much as 125 amperes per square centimeter of cathode area was obtained for pulsed operation. To satisfy the needs

for tubes designed for high-power continuous operation, as in radar jamming, cathodes were developed in which 13 amperes per square centimeter of cathode could be obtained in the laboratory. This figure compares with 0.5 to 2.5 amperes per square centimeter customarily used for the design of pre-war tubes for broadcast and similar services.

Incorporated in the research program of this group, and soon to be reported in greater detail by Albert Eisenstein and Abraham Fineman, '38, were x-ray diffraction and electrical conductivity investigations of the oxide cathode. The x-ray diffraction work, carried out in the Institute's Department of Physics, was directed toward establishing possible correlation between the physical and chemical structure of the cathode and its electron-emitting properties. Special beryllium-windowed high-vacuum tubes were constructed to permit x-ray diffraction patterns of the cathode to be taken in vacuum. A series of patterns taken at different periods of time allowed a study of the forming and activation of the cathode — when the carbonates break down to oxides — as well as the alterations during extended periods of life. These studies are of particular importance since the cause for the relatively large emission of oxide-coated cathodes has not been completely understood; certainly their manufacture has proceeded on an empirical rather than on a scientific basis.

Measurements of the conductivity of the cathode with respect to the flow of pulsed currents were made by means of probes imbedded in the oxide coating. These measurements, plus the evidence of x-ray diffraction patterns, indicated the existence of a high-resistance interface

region between the cathode base metal and the oxide coating. Further studies of oxide-coated cathodes are in progress at the Institute's Research Laboratory of Electronics.

Antimetabolites

SOME years ago the Popeye school of nutritional thought was discredited by discovery of the fact that calcium in spinach is not available nutritionally because oxalic acid present in the spinach fixes that vegetable's calcium as unassimilable oxalates. Parallel research later showed that much of the iron in whole wheat is similarly inactivated in the form of unassimilable phytates by phytic acid present in the wheat grain, so that enriched white bread, fortified with inorganic iron salts of proven assimilability, is a far better source of available food iron than is whole-wheat bread of the same total iron content.

Oxalic acid and phytic acid render unavailable the calcium of spinach and the iron of whole wheat, respectively, by simple formation of unassimilable salts. But actual destruction of labile nutritive factors, such as vitamins, may result from the presence in foods of enzymes antagonistic to these unstable factors. For example, a recent study has shown that clams contain a potent thiaminase, an enzyme capable of breaking down thiamine, vitamin B₁. This thiaminase is itself subject to destruction by heat, so that cooked clams have little antithiamine activity. But clams are often eaten raw; the prefacing of a meal with a clam cocktail may therefore result in destruction of a significant proportion of the thiamine in other foods composing the meal.

A third, still more complex, relationship tending to reduce nutritive value of foods below levels shown by laboratory analysis involves substances which have been termed "antimetabolites." Antimetabolites enter into metabolism along with the food factor they antagonize and, without actually destroying the factor, effectively block its beneficial effect. In general, antimetabolites closely resemble in chemical structure the food factors they block; because of this chemical similarity, antimetabolites can displace from metabolism their corresponding beneficial food factors. Then, since antimetabolites lack nutritive value, they are capable of producing nutritional deficiency, regardless of how abundant in the diet is the particular factor they antagonize. Antimetabolites effective against vitamins and against amino acids (the nutritive components of proteins) have been recognized.

Pyriethamine, the pyridine analogue of thiamine, is an antimetabolite effective against thiamine. Another substance antagonistic to this vitamin is the 2-*n*-butylpyrimidine homologue of thiamine; this compound has not been given a common name, and its chemical designation would occupy several lines of type. Pantoyltaurine has been shown to be capable of blocking the vitamin pantothenic acid. Galactoflavin is an antimetabolite effective against riboflavin, vitamin B₂. One substance may be antimetabolic to two vitamins, as is alpha-tocopherol quinone, which can block not only alpha-tocopherol (vitamin E) but also vitamin K.

Among the amino acids, ethionine blocks the nutritional value of methionine, and thienylalanine blocks phenylalanine. Note that here again, as among the vitamins, amino acid antimetabolites as indicated by their

names are closely related chemically to the food factors they antagonize.

What is the practical importance of the antimetabolites? So far as normal foods are concerned, these substances have little significance in well-chosen, varied diets. Spinach lovers may indulge their bent at will; for spinach makes valuable nutritive contributions other than calcium, and calcium may readily be obtained from other foods, particularly milk products. The gourmet may with impunity down his daily dozen raw clams, so long as his fare is chosen carefully enough to supply him with a small surplus of thiamine above his actual requirement. Coffee has been shown to have antimetabolic effect against the vitamins biotin and inositol, but the amount of coffee required to produce a serious deficiency of these vitamins is many times what a human being would be able to ingest; on the favorable side, coffee is recognized as a valuable source of the B vitamin niacin.

But in the field of drugs, antimetabolites demand consideration. Aspirin, for instance, has been shown to have antivitamin K activity. This fact is the basis of a recently issued United States patent covering the administration with aspirin of vitamin K in sufficient quantity to satisfy the antivitamin effect of this drug, thus leaving unimpaired the body's supplies of vitamin K.

But the most dramatic practical aspect of the antimetabolites, still a mere possibility, is the hope that these substances may be used to inhibit malignant tumors. In essence, malignancies are areas of uncontrolled growth, and since no tissue can grow unless its requirements of vitamins are met, it is logical to attempt inhibition of tumor growth by antivitamins. Reduction of dietary vitamin supplies, however, may not be used to arrest neoplasms because then the whole body suffers as much as does the tumor, and death may result from vitamin deficiency before the cancer is fatal. Hence, research is now being aimed toward development of means for localizing the effect of vitamin antimetabolites to malignant growths, with the hope that such tumors may be "starved" while the nutritional welfare of the host remains unaffected.

Mathematics for Technology

IN the May issue of *The Review*, Francis Bitter, Associate Professor of Physics at the Institute, called for a more enlightened use and intelligent application of mathematics to the broad problems of society, pointing out that the social and economic sciences — and even our administrators — have potentially as much need for the calculus of variation, simultaneous equations, and probability theory as have the research workers in the physical sciences. The engineer has long employed mathematics as a highly effective tool. For him, mathematics is something practical with physical significance.

Greater emphasis on the utilitarian aspects of mathematics is implied in a new policy recently adopted for the *Journal of Mathematics and Physics*. The *Journal* will be "exclusively a medium for the publication of mathematical papers dealing with topics from the fields of engineering and applied physics, or describing mathematical methods likely to be of use to the research worker" according to Eric Reissner, '38, Assistant Professor of Mathematics at the Institute and managing editor of the *Journal*.



American Airlines, Inc.

Airport Design

Municipalities and Air-Line Operators Alike Face the Challenge of Adequate Airports for a Rapidly Growing Transport Industry

BY A. J. BONE

AIRPORTS are fast becoming a major problem of air transportation. For the most part, existing airports are inadequate or obsolete. La Guardia Field, N. Y., was the last word in airports in 1939 but is now being supplemented by a new airport seven times as large at Idlewild. The Washington National Airport, opened in 1941, had the benefit of the most advanced thinking on airport design. Now a \$16,000,000 program of expansion is planned at that airport.

The trouble stems in part from a difference in design practices. Airports have been built to last a generation, whereas aircraft are expected to be superseded by more advanced models almost as soon as they are flown. Another factor contributing to obsolescence has been the failure of airport designers to anticipate the rapid growth in air traffic. A thorough study of both aircraft development and air traffic potentials is essential to sound airport planning.

Air Traffic Potentials

In the years immediately preceding World War II air passenger traffic measured in passenger-miles was growing at the rate of 43 per cent a year, mail ton-miles were increasing at the rate of 21 per cent, and air express at the rate of 34 per cent. These sustained rates of increases were in themselves ample evidence that obsolescence was imminent, particularly in terminal facilities.

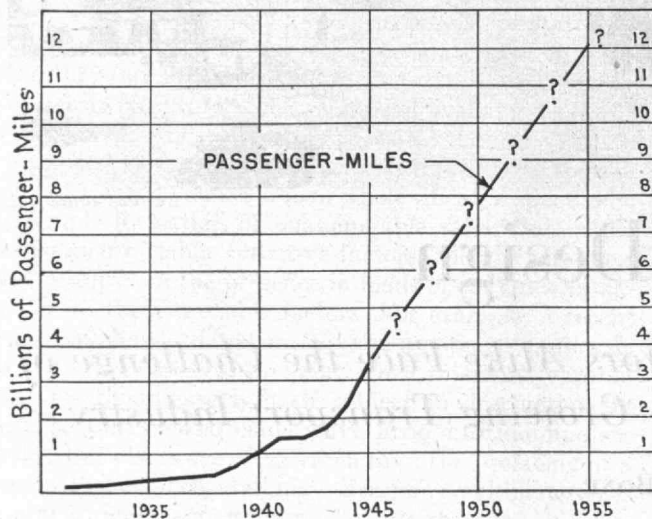
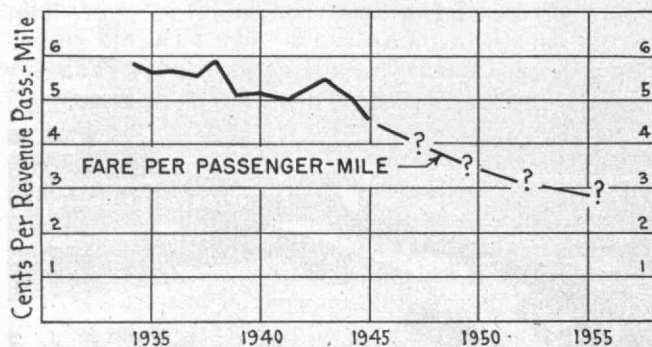
In 1942 the air lines were severely hampered in their domestic operations when about half of their airplanes were taken over for military use. The air lines met this emergency by operating their remaining airplanes more miles a day and by flying with nearly full loads on all trips. Thus, they were able to hold their own in passenger-miles and, at the same time, to show unprecedented gains

in mail and express traffic. With the return of air transports by the Army in 1944 and the acquisition of surplus transports in 1945, air traffic resumed its upward trend. The increase in passenger-miles in 1944 over 1943 was 39 per cent, and in 1945 it was 55 per cent over 1944. Although the gains in 1945 were the greatest in the air lines' history, they still did not reflect the full traffic potential because the air lines lacked sufficient equipment to meet the demand adequately. The average load factor (per cent of seats sold) was nearly 90 per cent in 1945 compared with load factors of 65 to 70 per cent which may be expected when equipment is adequate.

The record of the last four years has been so distorted by the war that it forms an inadequate base from which to predict future passenger traffic. The factors influencing future growth will be the availability of equipment, the public attitude toward flying, the level of the national income, and, perhaps more than anything else, the level of air-line fares. In the six years prior to 1945, air-line fares averaged from 5 to 5.5 cents a passenger-mile. In 1944 and 1945 the air lines made fare reductions which brought the average fare to about 4.7 cents a passenger-mile in the latter part of 1945. As traffic volume increases and still more efficient transports become available, even lower fares are predicted.

Until recently the cargo traffic of the air lines has been limited to carrying relatively small volumes of mail and express. The growth in this traffic has been rapid during the war, but the trends to date are small indication of the future. Air mail will increase substantially if all long-distance first-class mail is sent by air at regular first-class postal rates, and if air parcel post is inaugurated.

Air express will also increase as rates come down, but the potential is pretty much limited to emergency and



Passenger fares and passenger-miles: As passenger fares come down, air traffic will grow. Current opinion forecasts a fourfold increase in passenger traffic during the next 10 years.

high-valued shipments. Recently the air lines have inaugurated air freight service independent of air express and at much lower rates. New companies have also entered the air cargo field seeking bulk or plane-load traffic. This type of air cargo service is so new that its growth cannot be predicted with any certainty. Some believe it may ultimately exceed the volume of air passenger traffic.

Aircraft Design Leads Airport Design

Aircraft design and not airport design has set the pace in air transportation development. This is naturally so because the design of aircraft is characterized by constant change and improvement, whereas airport design is concerned with such relatively long-lived elements as grading, drainage, pavement, roads, and buildings.

The trend in air transport design in recent years has been toward larger payloads and higher speeds. In the attainment of these goals wing loadings (gross weight divided by wing area) have steadily increased. As high wing loadings imply high take-off speeds and longer take-off runs, longer and longer runways have been required.

Another factor influencing runway length is power loading (gross weight divided by total horsepower). Generally speaking, the more pounds to be lifted per horsepower, the longer will be the take-off run and the flatter the take-off path in climbing out of the airport. The trend in power loading, however, has been downward in recent models, but the change has been small compared with the great increase in wing loading.

In order to meet runway length requirements, airport sites have had to be enlarged and, in some instances,

abandoned in favor of new sites. Grading, drainage, and pavement costs have soared. Ultimately, some limit, economic or operational, may be reached in runway length and airport size. Radical changes in aircraft design, such as the universal use of assisted take-off devices coupled with braking by reversible pitch propellers or other retarding devices, give promise of shifting some of the responsibility for meeting take-off and landing requirements from the airport designer to the aircraft designer. In the immediate future, long runways appear in demand, but radical improvements in aircraft take-off and landing abilities could remove the necessity for huge airports.

With the coming of the war, emphasis in aircraft design shifted from civil to military needs. The normal replacement of civil air transports was halted, and the commercial air lines were left with a practically standard type of equipment: the 21-passenger Douglas DC-3. The airplanes that were being built to supersede the DC-3 became military transports.

Replacement of civil air transports has now begun and will continue at an accelerated rate. At first the air lines will supplement the DC-3 with such modifications and adaptations of proven military transports as the 44-passenger Douglas DC-4, the 60-passenger Douglas DC-6, and the 56-passenger Lockheed Constellation. Later, as technological advances growing out of the war are applied to commercial airplanes, new transports will appear which will be designed specifically for different types of passenger and cargo service. These new airplanes will doubtless present new problems in airport design and materially modify airport terminal functions.

Design Standards

The essential features of an airport are the runways on which the airplanes land and from which they take off; the paved apron or ramp at the terminal on which the airplanes are loaded, unloaded, and serviced; the terminal building for housing airport activities and handling passengers, mail, and cargo; hangars and shops for reconditioning planes; and parking lots and driveways for use of patrons, employees, and visitors.

The Civil Aeronautics Administration has recommended standards for the design of such features as runway width, length, and direction, drainage, paving, lighting, communications, and terminal facilities. Five classes of airports, based primarily upon runway length, have been set up. Class one is the smallest with unpaved landing strips 1,800 to 2,700 feet in length, suitable for private flying. Class two airports have paved runways 2,500 to 3,500 feet in length, suitable for private flying and for light transports. Class three calls for paved runways 3,500 to 4,500 feet long, adequate for medium transports. Class four has runways 4,500 to 5,500 feet long, serving main-line domestic air transports. Class five airports, with runways longer than 5,500 feet, are designed for the largest airplanes now engaged in transcontinental and overseas transport.

The Civil Aeronautics Administration has published manuals of airport design and has also issued technical reports on various subjects pertaining to aircraft performance, particularly with reference to runway requirements. For an industry which is growing as fast as air transport, no set of standards can remain valid very long without revision, nor may all standards be applied rigidly

at all locations without considering the special problems presented by each site.

The air lines have initiated airport design studies on their own behalf in order that they may have definite suggestions to offer whenever airport improvements on their system are under discussion. The unique tangential runway layout adopted for New York's new airport at Idlewild grew out of a scheme advocated by the American Airlines, Inc., with the support of the other air lines serving New York.

The Airport Site

A city airport of class four or five requires a nearly flat area of from one to four square miles located within easy access of the business district and at the same time sufficiently distant from tall buildings, spires, stacks, and hills to allow unobstructed approaches to the ends of all runways. Such a site is almost impossible to find in built-up metropolitan areas. Some cities, such as New York, Washington, and Boston, have met the problem by creating a site at considerable expense by filling in large water-front areas. Inland cities have been forced to choose sites far removed from the center of the city, and in mountainous regions hills have been leveled and valleys filled to make suitable sites. The following airport areas give some idea of the evolution in airport size: Boston, 250 acres in 1930; La Guardia, N. Y., 584 acres in 1939; enlarged Logan airport at Boston, 2,500 acres in 1946; and Idlewild, N. Y., airport, 4,500 acres in 1946.

The selection of an airport site is closely related to other phases of city planning, such as land use and transportation. The airport will attract industries related to aviation and may later attract industries using air transportation. In time, the airport will become the center of a new industrial community. The extent to which the airport and its activities will influence residential development in its environs is difficult to predict. Workers at the airport community may desire homes nearby, whereas the noise and industrial atmosphere of the airport may discourage home building.

At most cities ground transportation from the airport to the city center is excessively slow and costly when compared with the air trip. The present ground speed over city streets averages 20 miles an hour or less, and the fare is about 12 cents a passenger-mile. In the air the average speed is around 150 miles an hour (soon to be higher), and the fare is about 4.5 cents a passenger-mile. The volume of air traffic has been so small in the past that it has been handled in special limousines, taxis, or private cars. As traffic grows, express bus service at moderate fares will be justified, and the airport workers will need low-cost public transportation. With the possible exceptions of the largest cities where rapid transit is available, ground transportation will be by motor bus or automobile. To insure satisfactory transportation facilities for the present and future, airport planning must be co-ordinated with highway planning. The site should preferably be on an existing express highway. If this is not possible, it should be near the location of a proposed express highway that is likely to be built soon because it is urgently needed by the community as a whole as well as by the airport.

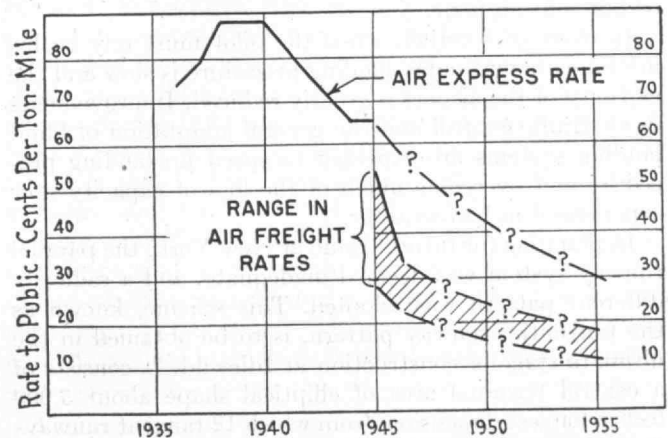
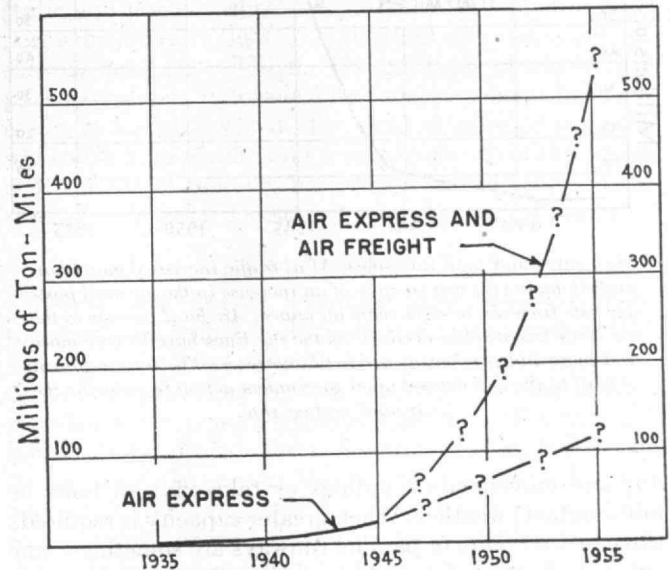
Although surface transportation to the airport will be predominantly by motor vehicle, the helicopter may come into use for the transportation of passengers and mail

from the airport to various parts of the metropolitan area.

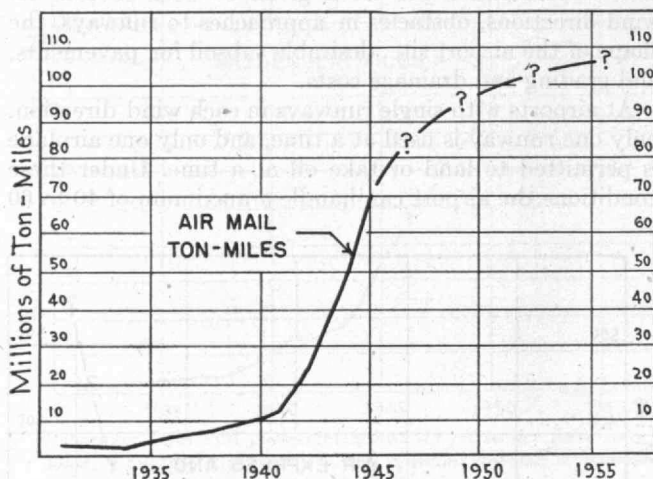
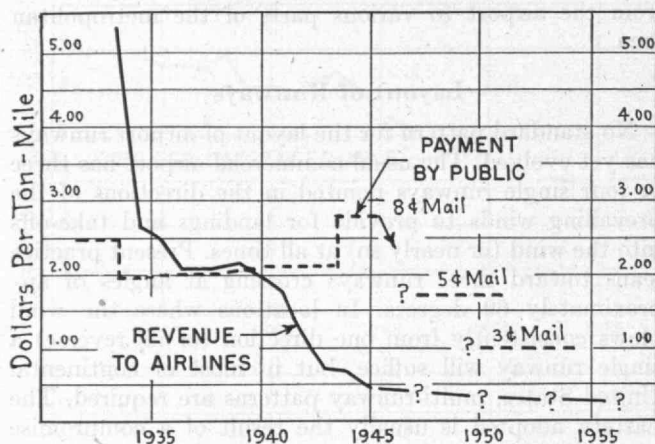
Layout of Runways

No standard pattern for the layout of airport runways has yet evolved. The usual commercial airport has three or four single runways pointed in the directions of the prevailing winds to provide for landings and take-offs into the wind (or nearly so) at all times. Present practice leans toward three runways crossing at angles of approximately 60 degrees. In locations where the wind blows consistently from one direction (or its reverse) a single runway will suffice, but in most of continental United States, multi-runway patterns are required. The pattern adopted is usually the result of a compromise after consideration has been given to such factors as: wind directions, obstacles in approaches to runways, the shape of the airport site, desirable subsoil for pavements, and grading and drainage costs.

At airports with single runways in each wind direction, only one runway is used at a time, and only one airplane is permitted to land or take off at a time. Under these conditions the airport can handle a maximum of 40 to 60



Air express rates and air express ton-miles: Air express rates have been high, and the traffic volume small. Reductions in air express rates and the introduction of air freight at much lower than air express rates will open new markets to air cargo and will cause an increase in traffic which is difficult to appraise. Some predictions for 1955 run as high as 2,000,000,000 ton-miles.



Mail rates and mail ton-miles: Mail traffic increased more than fivefold during the war in spite of an increase in the air mail postage rate from six to eight cents an ounce. Air mail revenue to the air lines has steadily declined as the air lines have become more and more independent of air mail subsidies. The future growth of mail traffic will depend upon government action in reducing the air mail postage rate.

airplane movements (landings or take-offs) an hour in fair (contact) weather. When greater capacity is required, three or four pairs of parallel runways are sometimes laid out in each wind direction, providing 80 to 100 landings or take-offs an hour.

In overcast weather, when the pilot must rely on his instruments and radio, landing procedure is slow and the capacity of the airport is greatly reduced. Improvements in air traffic control and the general adaptation of blind landing systems are expected to speed up landing procedure and overcome much of the loss of capacity now experienced in bad weather.

In planning for future traffic at New York, the parallel runway system was deemed inadequate, and a radically different pattern was adopted. This scheme, known as the tangential runway pattern, is to be obtained in the ultimate stage of construction at Idlewild. It consists of a central terminal area of elliptical shape about 5,000 feet in longest dimension, from which 12 tangent runways diverge at angles of 30 degrees, like the vanes of a giant pin wheel. It is claimed that in good weather this layout can handle 360 airplane movements an hour: three landings on one side of the terminal and three take-offs on the other side to occur simultaneously. In overcast weather when instrument landing procedures are neces-

sary the capacity is estimated at 240 plane movements an hour. Since all runways lead directly to the terminal apron, taxiing distances are shorter than for the parallel runway layout.

The demands of recent aircraft for longer and longer runways has been mentioned above. A means for determining desirable runway length in terms of aircraft weight and performance is provided in the Civil Air Regulations for Airplane Airworthiness issued by the Civil Aeronautics Administration.

These regulations prescribe three conditions to be met. Briefly they are: (1) The runway length must be such as to permit the airplane to accelerate for take-off in still air and then, in the event of engine failure, to be brought to a stop within the length of the runway; (2) the length must be sufficient to allow the airplane to accelerate for take-off and then, in the event of engine failure, to be able to continue with one engine in operation and climb to a height of 50 feet before reaching the boundary of the airport; and (3) for landing, the runway length must be sufficient to permit the airplane to clear a 50-foot height at the beginning of the runway, make contact with the airport surface, and be brought to a stop within 60 per cent of the runway length.

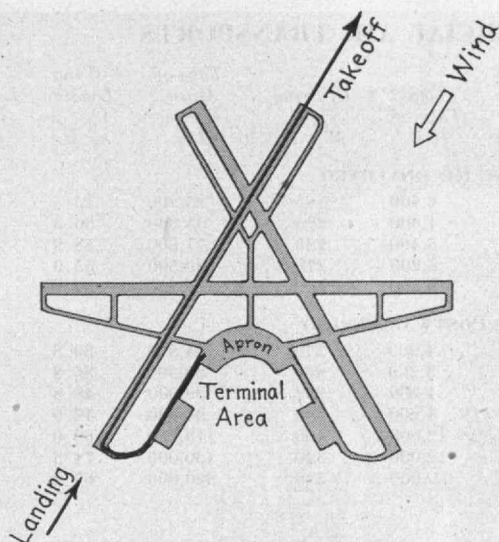
For new transports, these regulations will determine the maximum gross weight that may be taken off from or landed on a runway of given length and elevation. The runway length required to get a given plane into the air increases with altitude because of the reduction in the density of the air. The increase in length required is equivalent to approximately one quarter of the elevation of the airport above sea level. Hence, if a 5,000-foot runway is required at sea level, a 6,300-foot runway would be required at Denver, which is about 5,300 feet above sea level. Not only is the airport construction problem made difficult by mountainous terrain but a larger site is needed than in the relatively flat coastal areas.

The Pavement

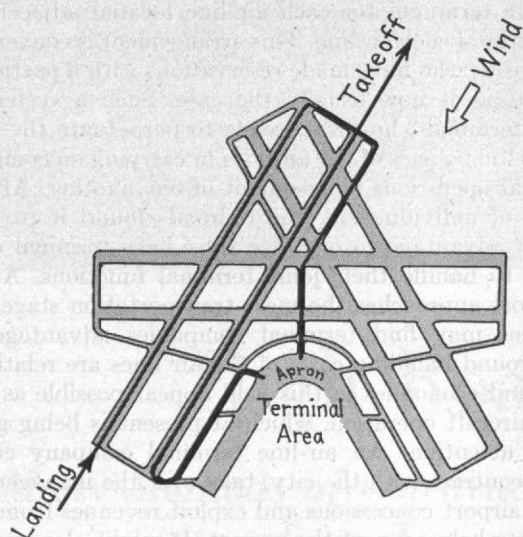
Many of the principles of highway design and construction apply also to airports with some new problems added. The wide and relatively flat paved areas require more elaborate drainage systems than do highways, and the loads applied by the heavier transports far exceed those encountered on highways. Truck wheel loads are usually limited to 12,000 pounds or less, whereas the B-29 and its transport counterpart, the Stratocruiser, have wheel loads of about 60,000 pounds. Even heavier loads are forecast for transports of the future.

At the beginning of the war no satisfactory theory existed for the design of pavements to support such heavy loads, nor was any experience with such loads available. A theory for the design of concrete paving slabs had been developed by H. M. Westergaard, but much remained to be learned about the relation between the subgrade and the pavement in order to evaluate certain constants in the Westergaard formulas. Only a limited amount of research had been done on the design of flexible pavements (gravel or stone bases with bituminous surfaces), and even this research was with light wheel loads.

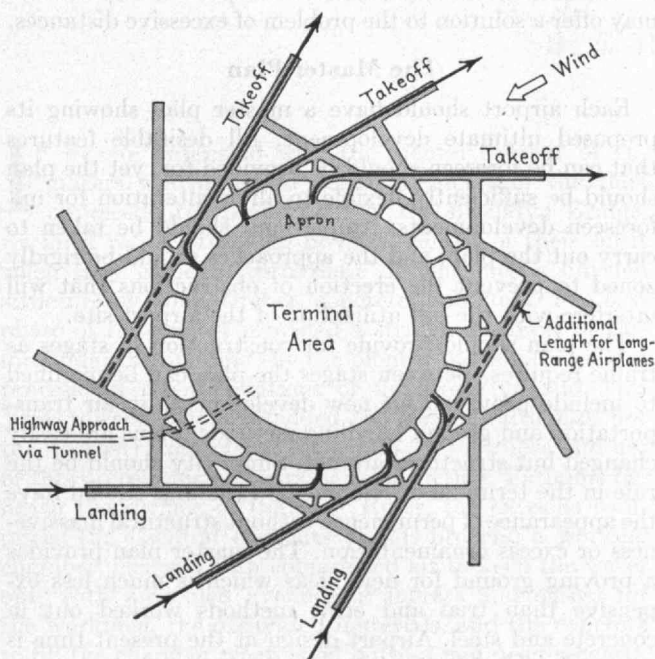
To meet the war emergency, the United States Engineer Department of the Corps of Engineers was assigned the task of producing adequate design procedures for military airports to serve heavy bombers and transports. With no time available for adequate research, the Engineers



SINGLE RUNWAY LAYOUT
ONE LANDING OR ONE TAKEOFF AT A TIME



PARALLEL RUNWAY LAYOUT
ONE LANDING AND ONE TAKEOFF AT SAME TIME



TANGENTIAL RUNWAY SCHEME
THREE LANDINGS AND THREE TAKEOFFS AT SAME TIME

adopted an empirical method developed by the California Department of Highways for the evaluation of subgrade support and for the design of flexible pavements. The basis of this method is a penetration or "bearing" test on a compacted, saturated sample of subgrade or base course material. The bearing value for any material is expressed as a percentage of the standard value for an excellent base of broken stone. The percentage is called the "California Bearing Ratio" or "C.B.R."

Over a period of years the California Highway Department developed, from observation of pavements in service, curves of total pavement and base thickness required for subgrades of various California Bearing Ratios under truck wheel loads 7,000 and 12,000 pounds, respectively. The Engineers, as an emergency measure, extrapolated additional curves to cover wheel loads up to 75,000 pounds. They then embarked on an extensive program of research to secure data from which to validate or modify the C.B.R. curves and to develop new methods of design if found desirable. Full-scale test pavement sections were built at several locations throughout the country and were loaded to destruction by heavy wheel loads simulating airplane loads. Load-deflection relations were investigated under circular bearing plates and under static and moving wheel loads. These tests for the most part substantiated the C.B.R. method as a useful tool for runway pavement design. The problem of theoretical pavement design in terms of load and pavement behavior is yet to be fully solved. The data obtained during the war, both from testing and from experience in the actual construction of military bases, have added much to the store of knowledge necessary to develop such a theory.

The Terminal

In the past, airport terminals have frequently been too small and built of such permanent construction that expansion has been difficult. Designers have been short-sighted in providing for air transport growth and in visualizing the airport terminal's function. The terminal layout should provide for a smooth flow of surface traffic to and from the airport terminal and adjacent hangars and service buildings, with ample parking space for both patrons and workers. Direct access to waiting planes is desirable for passengers who have purchased tickets in advance. For others, and for those waiting for plane connections, an attractive and commodious waiting room is required, conveniently located with respect to ticket offices and public conveniences. Mail and express must be transferred from truck to plane, usually at a lower level, where it will not come in contact with passengers. Space is also required for air-line offices, the airport manager, and traffic control and weather bureau staff and equipment. Provision should be made for handling spectators in such a way that they may view the activities of the airport without interfering with airport activities or mixing with passengers. Concessions catering to patrons and the public, such as restaurant, barber shop, haberdashery,

Runway patterns: The simple three-way layout (top) permits 40 to 60 plane movements (landing or taking off) an hour. Parallel runways (center) double this capacity. The tangential scheme (bottom) with three landings and three take-offs occurring simultaneously will permit up to 360 airplane movements an hour. A modification of the tangential layout has been adopted for the final stage of development of New York City's huge new airport at Idlewild.

CHARACTERISTICS OF TYPICAL COMMERCIAL AIR TRANSPORTS

<i>Make of Airplane</i>	<i>Number of Seats</i>	<i>Wing Span</i>	<i>Number of Engines</i>	<i>Total Take-off H.P.</i>	<i>Cruising Speed¹ (M.P.H.)</i>	<i>Take-off Gross Weight (Lbs.)</i>	<i>Wing Loading (Lbs. per sq. ft.)</i>	<i>Power Loading² (Lbs. per H.P.)</i>
TRANSPORTS NOW IN SERVICE OR BEING RECONVERTED								
Douglas DC-3.....	21	94' 7"	2	2,400	185	25,200	25.5	10.5
Boeing Stratoliner.....	38	107' 3"	4	4,800	225	54,000	36.3	11.3
Douglas DC-4.....	44	117' 6"	4	5,400	239	71,300	48.9	13.2
Douglas DC-6.....	48-60	117' 6"	4	8,200	278	80,500	55.0	9.8
Lockheed Constellation.....	56	123'	4	8,800	300	86,250	52.3	9.8
NEW MODELS PROPOSED FOR IMMEDIATE POSTWAR PERIOD³								
Martin 202.....	30-42	92' 9"	2	4,200	270	34,300	39.8	8.2
Douglas DC-8.....	34-48	110' 2"	2	3,260	260	39,500	35.9	12.1
Boeing 431-16.....	30	96'	2	4,200	252	36,000	48.8	8.6
Consolidated-Vultee Model 240.....	40	88'	2	4,200	300	34,000	42.0	8.1
Republic Rainbow.....	40-46	129' 2"	4	12,000	400	113,250	69.0	9.4
Boeing Stratocruiser.....	76-100	141' 3"	4	*12,000	340	130,000	74.3	10.8
Consolidated-Vultee Model 37.....	204	230'	6	30,000	340	320,000	67.2	10.7

¹ Cruising speed varies with altitude.

² Based on take-off horsepower.

³ Characteristics of proposed airplanes are modified frequently during development.

dashery, soda bar, and souvenir counter, should be encouraged as added attractions to the airport and sources of airport revenue.

At present, airplanes are unloaded, loaded, and serviced on the apron adjacent to the air terminal building. A fleet of small vehicles, some motorized and some pushed by hand, are used to bring mail, express, and supplies to and from the airplane. This process, employing much hand labor, may be but a passing phase. As air traffic grows, mass transportation methods may evolve which are difficult to foresee. Mail and express will probably continue to be carried in the same airplanes as passengers and will, therefore, have to be handled at the air-line station. Air freight will move to an increasing extent in separate, all-cargo transports, which may be better served at another part of the airport or at a separate airport.

The airport terminal differs greatly from a railroad terminal in the spacing of the gates required for loading and unloading passengers. A frontage of about 20 feet at a rail terminal will accommodate a track and platform that can serve a train of several hundred passengers. At the airport terminal each plane requires from 100 to 175 feet of frontage in order to handle 20 to 60 passengers a plane with speed and safety.

If each plane is allowed 30 minutes at the terminal, 10 berths will be required to match the capacity of a single runway at 40 movements an hour. If each plane is allotted a circle of 150-foot diameter, the frontage (or apron) will be 1,500 feet long. If 360 plane movements an hour are to be served, as planned for New York's airport at Idlewild, 90 berths will be required, which, at 150-foot intervals, would extend 13,500 feet or two and a half miles. In order to provide long frontages without exceeding a reasonable walking distance from a central terminal building, the straight apron in front of the terminal has been abandoned in favor of curved or nose-shaped aprons running along three sides of the building location. In some designs the terminal area has approached a circular shape, and in others the perimeter has assumed an indented or scalloped shape to give a maximum frontage with a minimum internal area.

As the airport terminal area increases in size, one central terminal building becomes less effective as a passenger station. Current thought is turning toward

separate terminals for each air line located adjacent to the berths of each air line. This arrangement is convenient for patrons who have made reservations with a particular air line, as is now usually the case. Such a system of single terminals, however, tends to perpetuate the individualistic policies of the air lines in carrying on complete terminal operations independent of one another. After a period of individualism, the railroads found it to their mutual advantage to organize subsidiary terminal companies to handle their joint terminal functions. As air transport approaches the mass transportation stage, the air lines may find terminal companies advantageous. The ground handling costs of the air lines are relatively high, and economies in this field appear possible as well as in aircraft operation, which at present is being given major attention. An air-line terminal company could, under contract with the city, take over the management of the airport concessions and exploit revenues from this source to help support the airport. It might also provide ground transportation to the city. In the long run, the central terminal idea with intra-airport transportation may offer a solution to the problem of excessive distances.

The Master Plan

Each airport should have a master plan showing its proposed ultimate development. All desirable features that can be foreseen should be provided for, yet the plan should be sufficiently flexible to allow alteration for unforeseen developments. Ample land should be taken to carry out the plan, and the approaches should be rigidly zoned to prevent the erection of obstructions that will interfere with the full utilization of the airport site.

The plan should provide for construction in stages as traffic requires. Between stages the plan can be modified to include provision for new developments in air transportation and ground handling methods. Plans are easily changed but structures are not. Simplicity should be the rule in the terminal development. Buildings should have the appearance of permanence without structural massiveness or excess ornamentation. The master plan provides a proving ground for new ideas which is much less expensive than trial and error methods worked out in concrete and steel. Airport design at the present time is a most fluid and intriguing problem, taxing the ingenuity and foresight of architects and engineers.



Philip D. Gendreau

High Road to Brooklyn

Many Methods of Construction of Modern Suspension Bridges Stem from Those Originally Developed in the Building of the Brooklyn Bridge

BY E. H. CAMERON

II

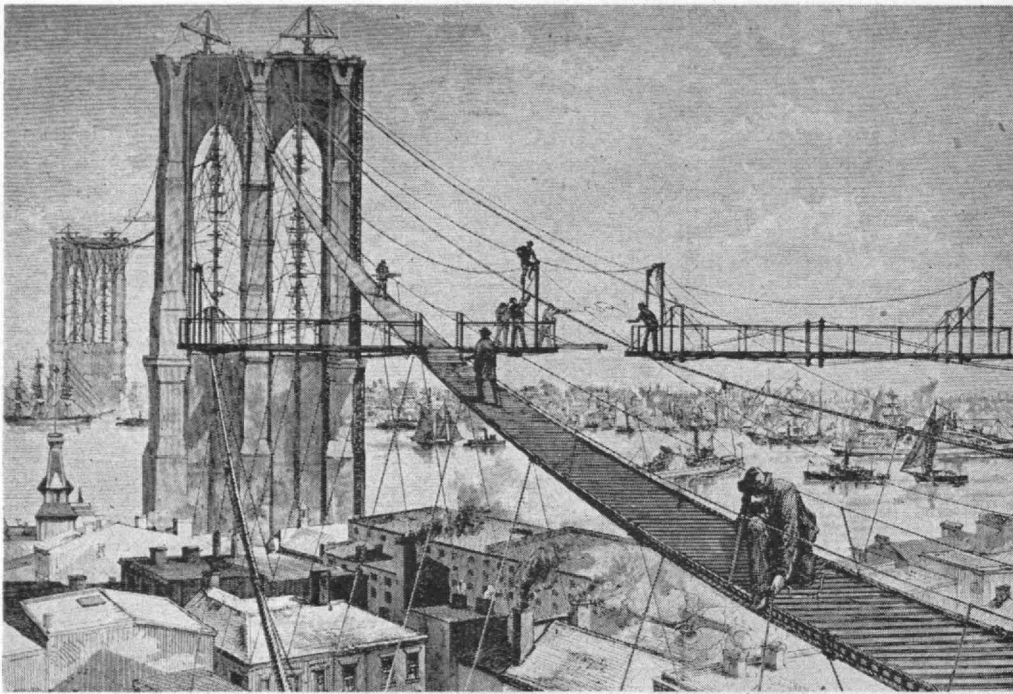
IF we are impressed with the mental courage of engineers who dared to design members of the then unprecedented proportions of the Brooklyn Bridge, we must respect the high physical caliber of their spirit when they came to turn these designs into a finished structure of stone, timber, concrete, and steel. The first phase of the project provided a striking example of this fortitude: the building (by the pioneer pneumatic caisson process) of the foundations of the Brooklyn and New York towers. These provided the largest (although not the deepest) example, to that date, of the successful use of this process for underwater construction. Fathoms beneath the surface of the East River, the caissons comprised the essential elements of this process: a working chamber, charged with compressed air to keep the water out, with air-sealed avenues of ingress and egress for the workmen, the excavated materials, and the concrete to fill the chamber when good bottom had been reached.

Perhaps the best way for us to appreciate how the

problems were met is to take an imaginary trip to their caissons, drawing upon the vivid reports of the chief engineer, Washington Roebling, as we describe this fanciful experience.

With the chief as our guide, we first squeeze through the small opening of the air lock of the Brooklyn caisson, bearing in mind that this mysterious atmosphere of compressed air will play macabre tricks on us if we fail to heed the warnings as to how to conduct ourselves. Of course, we must fix our jaws at the "certain angle" to protect our ears from the unbalanced air pressure, the chief says. Black smoke streams from the many candles that light the caisson. Blended with the sewage of generations, the muddy bottom stinks; we are glad that the sense of smell is not normal in compressed air.

Are we willing to take a chance with him, the chief inquires. Downward progress of the caisson has been at the rate of but six inches a week, and he wants to blast the boulders which have caused this slow rate. But what



Many a daring New York citizen crossed on the flimsy, temporary footbridge, four feet wide, built of oak slats, 200 feet above the East River. It was located about on the Bridge centerline and served three pairs of cross stagings, called cradles, in the river span (not yet built when this view was sketched), with other cradles in the land spans. Access to the four Bridge cables was from the cradles. Between cradles, buggies were used for applying marlin, clamps, and cable wrapping; occasionally the ex-sailor cable spinners went hand-over-hand.

of the concussion effect on the caisson and its equipment in the atmosphere of compressed air? To find an answer to this question he proposes to fire heavier and heavier shots from his pistol. If eardrums are not shattered, it will be safe to use gunpowder on the boulders. The experiment is successful, and the ability to blast the many boulders as they are encountered increases the rate of settlement of the caisson to 18 inches a week.

Half-naked men dive under the edge of the water shaft as we watch the removal of excavated material; it is their quick way of dislodging a rock that has stuck there. They have to hold their breath for three or four minutes, but in an atmosphere of compressed air the task is easy, Roebling tells us.

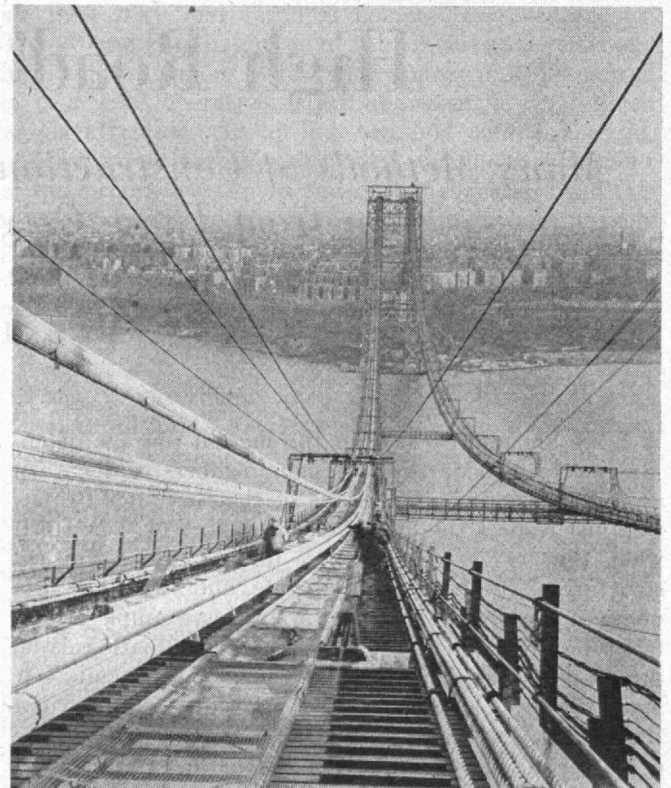
Suddenly the whole massive frame of the caisson settles "impulsively" with sharp snaps of crushing timber; the 30,000-ton structure above us is merely adjusting itself to its lower level now that more bottom has been dug out. That is a normal incident, we are told.

There are elaborate precautions against fire because materials ignite easily in compressed air. But a workman, stopping for lunch, has set down his candle too near a bit of oakum packing of the timber walls which has somehow been left exposed. With the chief, we shoot carbonic acid gas at the flame. The fire bursts out again, and ultimately we leave the caisson and watch fireboats and engines pour 38 streams of water to flood it. More than three months will be required to repair the fire damage.

We have had enough of this Jonah of a Brooklyn caisson; so, breathing God's good East River air, we go to the chief's office. He tells us that his force is normally organized in eight-hour shifts, 119 men on each shift, with the men remaining in the caisson to eat their lunch. Men often quit, the chief admits, as he compares the 360 jobs

with the pay roll of 2,500 names.

The Bridge played its part as a major project in a program of unprecedented bridge construction in America in the post-Civil War period. Basic pneumatic caisson methods were developed then that have been used ever since, with, of course, refinements due to the greater use of steel and reinforced concrete and the adoption of electrical apparatus. The major share of the credit for safe methods for such work is due to Captain J. B. Eads, who, at a high cost in human life, made important advances in underwater construction methods at the Mississippi River Bridge at St. Louis. These methods were adopted on many contemporary bridges. We may be sure that the men at Brooklyn closely fol-



The George Washington Bridge has four cables, arranged in pairs. In construction, each of the two pairs was served by a footbridge, 24 ft. 7 in. wide, providing access to the entire cable length between towers. Wire mesh filled the spaces between the slatted timber walkways. The two footbridges were carried by wire rope, like the one footbridge at Brooklyn, and had "storm systems" of guys to prevent too great disturbance from wind.

lowed the reports of Eads's means of combating the new occupational malady: caisson disease. They had to settle with Eads later for not obtaining his permission to use the St. Louis Bridge system, with patents relating to means used in sinking bridge piers.

It was at the deeper New York caisson that the effects of caisson disease were felt in their full severity. Gruesome reading is encountered in Surgeon Andrew H. Smith's account, which describes the symptoms of men after leaving the compressed air: "as if the patient had been struck by a bullet . . . as if the flesh were being torn from the bones"; three men died. A list of safety rules reads like modern regulations for work in compressed air.

Returning to the year 1946, we can feel that our experience in the Bridge caissons has revealed the 1870 status of pneumatic caisson construction.

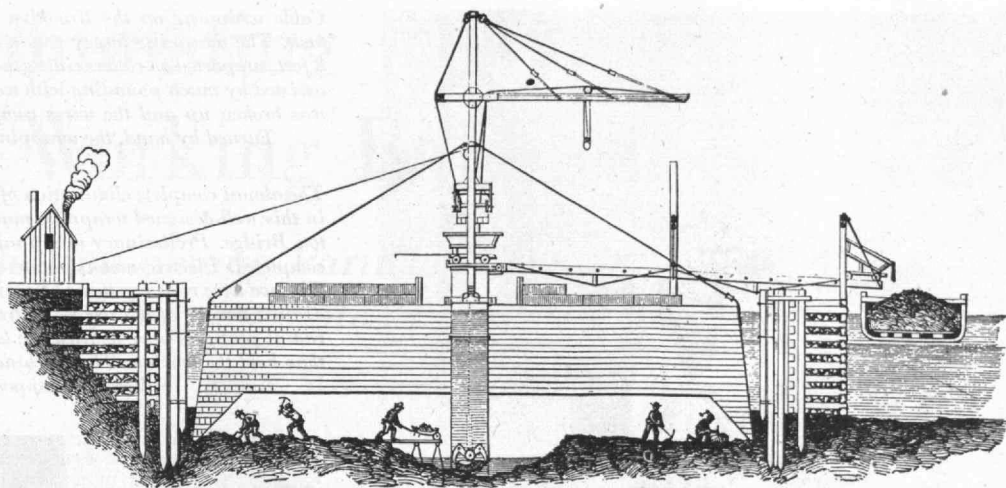
The Towers

Out of date as they are to the designer who now builds his suspension bridge towers of steel, the towers of the Brooklyn Bridge still inspire him to imitate in steel the masonry towers of Roebling. The steel towers of the George Washington Bridge, for example, are built so that granite-faced reinforced concrete encasement can be added.

Steel compression members of the magnitude required by the towers were unheard of in Roebling's time. The tragic first failure^o of the Quebec Bridge was undoubtedly the greatest influence toward tests of large steel compression members that should provide a rational method for their design. Perforce, Roebling had to make his Bridge towers of masonry, and he fell back on his architectural training at the Berlin Polytechnic Institute to give them their pleasing proportions. They are built mostly of granite, with some limestone. Of the thousands of shiploads of stone, only one vessel was lost by shipwreck.

Except for their aesthetic interest, the Bridge towers concern the present-day student only in a comparison with modern methods of construction of high masonry structures. When reading of the comparatively primitive methods in use in the Seventies one cannot help visualizing the patent stagings with railings, the electric elevators with safety brakes, the electric bell systems, and the acres of plank platforms used today on construction jobs.

Oversized lewises for raising the heavier stones were effective in all but one instance, when a stone was dropped 200 feet. Steam was satisfactorily brought 400 feet to the setting derricks at the top of the towers, but work was handicapped by limited methods of communication. Satisfactory signaling to the engineer below was particularly difficult. The most effective signaling system was found to be a loud whistle to call attention, followed by a flag used with a very positive motion.



Concise Description of the East River Bridge, by E. F. Farrington

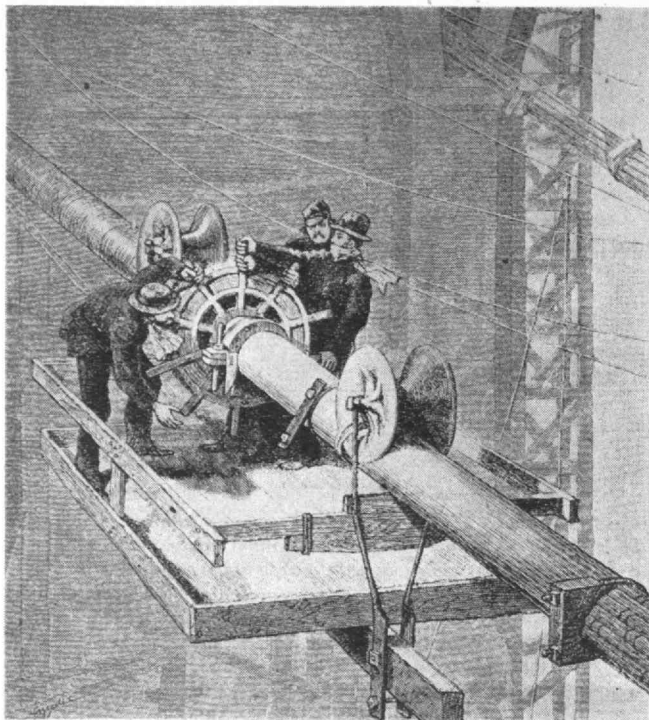
The upside-down timber box that comprises the Brooklyn caisson was built at a Greenpoint shipyard miles away, launched like a ship, and towed by six tugs to the site of the old Fulton Ferry. In plan, it is 168 feet long by 102 feet wide. Iron-shod cutting edges were to prevent the escape of the compressed air of the working chamber. It was sunk to hardpan under the weight of the tower masonry, added course by course, as excavators removed the mud and boulders below. With the chamber filled with concrete, the caisson is still in place, carrying its share of the weight of the Bridge.

Certain modern specifications could well emulate the fixing of the responsibility as to unloading. Steam power and derricks for unloading vessels were to be furnished by the Bridge company; the crews of the vessels were

MAJOR ENGINEERING DATA

Brooklyn Bridge Compared With George Washington Bridge

Item	Brooklyn Bridge	George Washington Bridge
Completion date of bridge	1883	1931
Duration of construction period (entire bridge)	13.4 years	4.1 years
River span	1,595 ft. 6 in.	3,500 ft.
Number of cables	4	4
Diameter of cable	15¾ in.	36 in.
Sag (center span)		
Basic design of J. A. Roebling	128 ft.	
Under final dead load		325 ft.
River clearance	133 ft.	195 ft. at New York 210 ft. at New Jersey
Side spans	930 ft.	650 ft. at New York 610 ft. at New Jersey
Length, center plus land spans	3,455 ft. 6 in.	4,760 ft.
Wires per cable	5,296	26,474
Strands per cable	19	61
Average wires per strand (approx. as reported)	278	434
Diameter each strand	3 in.	4½ in.
Diameter wire	No. 8 and No. 7 BWG	No. 6 BWG
	0.167 to 0.187 in. (As reported, 1880)	0.196 in. (over galv.)
Ultimate wire strength (specified minimum)	160,000 psi	220,000 psi
Specified elastic limit	About 75,000 psi	
Minimum yield point specified		150,000 psi
Length of single wire	14,357 mi.	105,000 mi. (Approx.)
Cable material	Crucible cast steel	Cold drawn steel
Cost		
Including approaches	About \$18,000,000	
Excluding approaches but including anchorages		About \$32,000,000



Harper's New Monthly Magazine

expected to assist by bringing the stone under the arm of the derrick and attaching the lewis to the hoisting block.

The Anchorages

At the anchorages the 19 strands of each of the Bridge cables flare out and are attached to eyebar chains. Each chain forms a curve, which swings down from the top of the anchorage to join a 23-ton cast-iron spider at the base. The eyebars and pins are of iron. True, Herr Krupp's plant at Essen had obligingly forged a sample bar of steel, two by nine inches, but iron was found to be more economical. The chains and spiders are encased in a masonry anchorage structure which, at the New York end of the Bridge, varies from 85 to 89 feet in height. Similar construction exists at Brooklyn. The anchorages thus form a part of the Bridge approaches. The "margin of safety" against uplift is two and one-half.

The anchorages each rest on a timber grillage, the top of which is a little below the level at which fresh water was found to stand, thus ensuring their permanent preservation. The Bridge is continued beyond the anchorages at each end by arched masonry viaducts, called the approaches.

The Cables

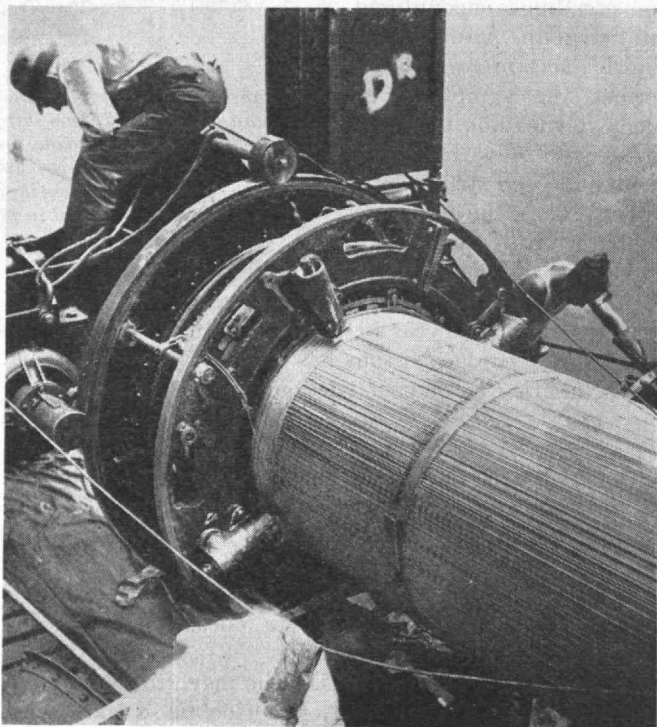
When they came to describe their problems on the cables of the George Washington Bridge, the engineers testified that their construction methods stemmed from those of the builders of the Brooklyn Bridge. The table gives a comparison of the two bridges: the earliest and the latest Manhattan suspension spans.

The foundations, towers, anchorages, and floor system of a suspension bridge may properly be deemed of secondary interest, compared with the cables. In their adoption of steel wire for the four cables, their faithfully performed tests to ensure its adequacy, and their ingenious methods of erection, the Brooklyn Bridge builders deserve the highest credit.

John A. Roebling had considered the use of wire of

Cable wrapping on the Brooklyn Bridge (left) was a hard manual task. The wrapping buggy was a crude, wooden platform, 12 feet by 8 feet, supported on rollers riding the cable. With steel squeezing clamps, assisted by much pounding with wooden mallets, the strand formation was broken up and the wires compacted to form the circular cables. Turned by hand, the wrapping reel advanced 20 feet a day.

The almost complete elimination of hand methods is apparent (below) in this well-designed wrapping machine used on the George Washington Bridge. Preliminary and final squeezing of the strands has been completed. Electric motors rotate a ring gear surrounding the cable. The two wire reels are turned by this ring through brake bands rubbing against flanges of the reel to control wire tension. Four spring-loaded radial plungers bear against the last few turns of wrapped wire and thus hold the tension. The machine is pulled ahead by a hand winch. Splices in wrapped wire were welded.



The Port of New York Authority

either wrought iron or steel. His successors wrote their wire specifications for steel, but they ruled out open hearth and Bessemer steels. This was not an offhand decision. While work proceeded in caissons and on towers, tests had been carried out to find a reliable cable wire. "One grave difficulty surrounded the question of steel, and that is, lack of uniformity of quality." So the first specifications carefully excluded Bessemer and open hearth steel and called for crucible cast steel. The wire was to be galvanized, another innovation.

Surprisingly enough, however, when the Bridge trustees overrode the original specifications and allowed bids on all kinds of steel, "it soon became manifest from samples received that both open hearth and Bessemer steels could be manipulated as to meet the requirements in every respect. . . ." Bids were received from American, English, and German steelmakers; prices ranged from 8.7 cents to 13.95 cents a pound for English crucible cast steel; 6.75 cents for Roebling Bessemer steel; 8.25 cents for open hearth steel; with an English firm bidding 6.14 cents for steel of an undesignated manufacture. Despite the satisfactory quality of the lower priced Bessemer steel, the trustees awarded the contract for crucible cast steel.

The revised specifications (Continued on page 500)

Discriminating Particles and Working Bubbles

Unnatural Selection among Particles Exposed to the Charms of Bubbles Improves Many a Mineral Crude

BY A. M. GAUDIN

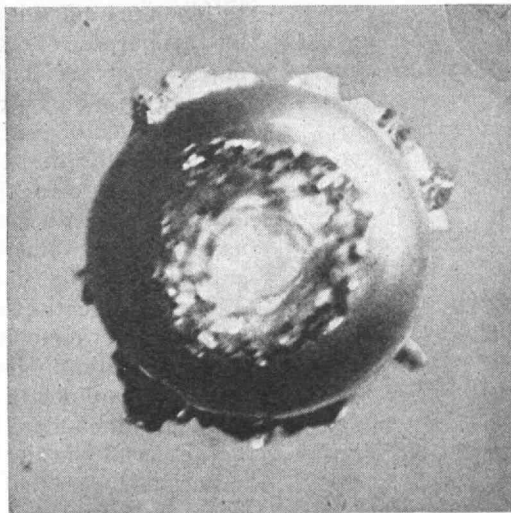
MINERAL crudes from the earth's crust — that is, metallic ores, raw nonmetallic minerals, salines, and solid fuels — are rarely in a state of purity that allows direct use. To put the crudes into useful form, wide use is made of the lifting power of small bubbles, which are made to adhere selectively to some of the solids (Fig. 1). This flotation process is so widely employed that annually more than 150,000,000 tons of crudes are wet-ground to the fineness of silt or mud, before separation by controlled bubbling. In engineering parlance, the total number of bubbles required annually for the industry is of the order of magnitude of 10^{18} .

These bubbles have the job of selecting certain types of solids from the many others that are simultaneously present in the swirling mud, attaching themselves to the selected particles, and rafting them to the surface, where they form a froth, sometimes evanescent and brittle, at other times permanent and tough. This foam varies not only in mechanical properties but also in feel and color. Sometimes the froth simulates liquid gold or bronze, as when the flotation process is applied to copper ores; at other times it has the silvery yet blue-black luster of freezing lead. At other times it looks like honey or is dead-white, chocolate, or even delicately pink or lavender. This diversity reflects the variety of the fields of application of the process to metallic-looking sulphides, to the dull alkaline-earth minerals, to salines such as potassium salts, to coal or sulphur, and even to an increasing group of substances that are far removed from minerals. For instance, flotation can be used to purify the liquor in which rayon threads are formed, to discard the ink from pulped secondhand paper, to separate crystals made in chemical processes, and to remove certain parts of wheat grains from others in the course of flour milling.

On a tonnage basis the largest field of application remains in connection with the dressing of sulphide ores of base metals. There, flotation is a leading unit operation and unit process along with such older unit operations as crushing, screening, classifying, leaching, filtering, and sintering.

But a field of greater mineral variety is one that is provided by nonsulphide mineral crudes such as cement rock, barite, alunite, mineral phosphates, potash salts, and other salines, as well as clays, feldspars, micas, and glass-sand. Most iron ores would also fall into this group, along with bauxite, magnesite, and chromite. This field is growing rapidly.

The third field of application in which large tonnage is in prospect is in cleaning coal. This field has had considerable development in Europe, but developments in this country have lagged, both because nature has endowed us with good coals and because users in this country have not been sufficiently critical of the quality of the coal they demanded. The fourth field may be viewed as embracing all nonmineral materials. It is both the most diverse and the newest.



S. J. Swainson, American Cyanamid Company

Fig. 1. A mineralized bubble carries with it several particles of sulphide minerals. The bubble was about one millimeter in diameter.

Inception of the Flotation Process

The flotation method has grown out of processes in which air played no part and in which, instead, an oil or grease took the parallel role. Only gradually, nay, reluctantly, has the concept been dropped that oil plays an essential part, and some people still speak of oil flotation. Yet it may be of interest to review briefly how oil was used and how we have learned to dispense with it.

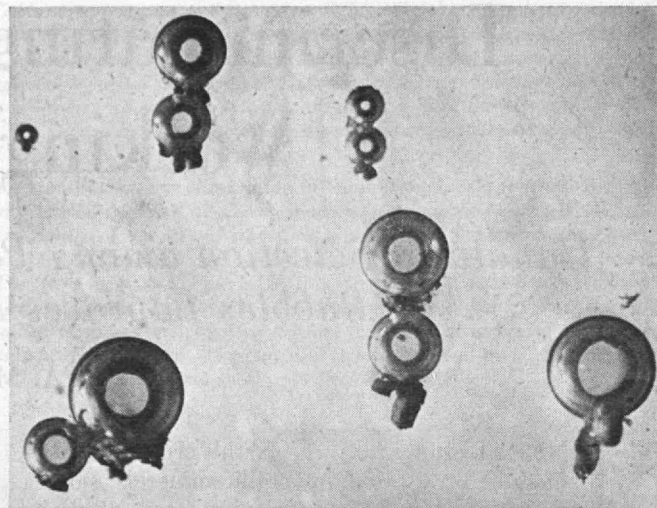
If we disregard the reference in Herodotus to the winning of gold by the use of pitch-daubed feathers — a gold-digging art practiced by prehistoric Amazons

— our oldest reference to flotation is in a manuscript written by the Persian scholar Muhammad ibn Mansur in 1491. Mansur describes several procedures for separating lazurite or lapis lazuli (a blue mineral pigment in demand for the tinting of faïence) from waste minerals as well as for separating a substitute blue pigment made from azurite, the basic copper carbonate. In one process Mansur directs the making of a paste of pitch or resin in linseed oil and the kneading of this paste with the ground mineral crude, then washing away the lazurite, leaving the gangue (calcite) sticking to and engulfed in the oily mass. It is interesting to note that this process was still in use for making ultramarine as recently as 1890.

In 1877, the Bessel brothers proposed that gas bubbles be introduced to help the separation of oiled graphite crude into an aerated oil-and-graphite mass on the one hand and a watery gangue on the other. Their invention was patented in Germany and directed the user to boil the mixture (from whence the gas bubbles arose), but it did not recommend the introduction of air bubbles. Since the invention was limited to graphite and required large quantities of oil, it achieved little success.

In the early part of the present century the basic process as we know it today was introduced, largely through the genius of a group of English engineers including Cattermole, Sulman, Picard, Ballot, Higgins, and Chapman. It consists of grinding finely the ore with water in the presence of a small amount of a fatty acid, such as "red engine oil," and a small amount of an inorganic acid, such as sulphuric acid, and in bubbling air (Fig. 2) through the pulp diluted to about one part of solids to four or five parts of water, this bubbling being readily accomplished by a submerged impeller. Their process still made use of oil (a fatty acid) but in such small quantity that the oil obviously acted to make possible the adhesion of air to the mineral rather than to serve as a levitating agent. At the same time, an acid was added to give the separation more selectivity, and the basic function of the working air bubbles was recognized.

More recently the process has been applied to a very wide group of solids until it has become possible to float



Henry R. Spedden, Jr.

Fig. 2. Bubbles at work, light loaded. This interesting illustration shows air bubbles teaming up to lift relatively heavy galena particles. Magnification is about 50 diameters.

any one of the constituents from certain mixtures (Fig. 3).

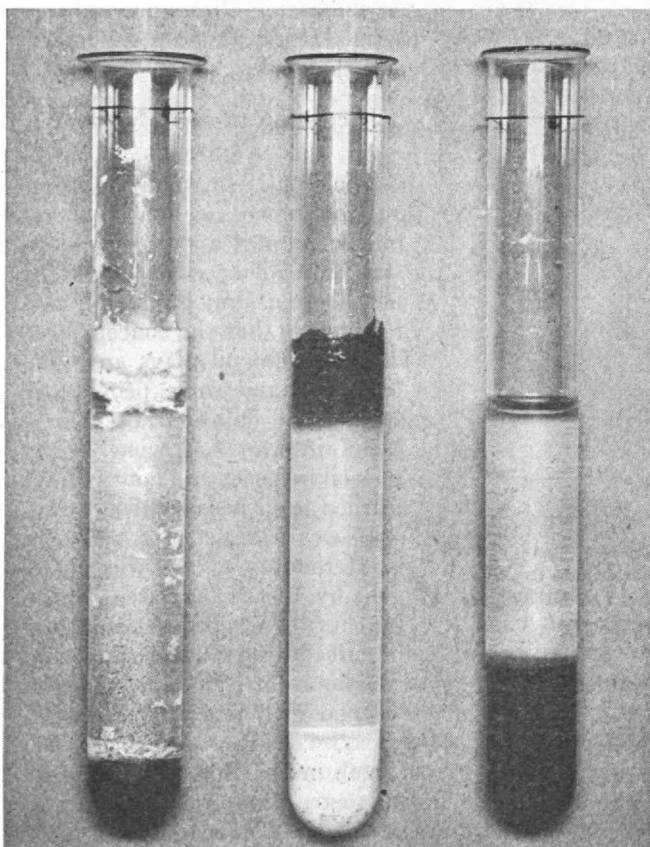
Growth of Flotation and Its Influence on Raw-Material Economy

For the past generation progress has been steady in (1) reducing the quantity of oil; (2) differentiating between soluble oils that promote frothing and insoluble oils that promote adhesion of solids to gas; (3) substitution of organic salts for the adhesive oils and invention for this purpose of organic salts, acids, and bases capable of providing special anionic or cationic hydrocarbon ions; (4) wider use of controlling factors, such as *pH*, and the concentration of various ions; (5) development of special techniques for the separation of extra-coarse particles, *e.g.*, by the process that has been called agglomeration; and (6) contrivance of simpler machines that, with the use of some servomechanisms, make the operation nearly automatic, so that in a large plant one operator can now supervise the entire flotation section.

It may be well to make brief mention of the very large scale of certain applications. Plants treating 500 tons of feed a day are not at all rare, and there are a number of plants in which more than 10,000 tons are treated a day. Yet, especially in the largest plants, the degree of mechanization is such that a search may have to be made to locate the operator.

The success of flotation has been due to the flexibility and adaptability of the process. A noteworthy advantage is the capability for treating material from one micron to one millimeter in size without requiring heat or substantial quantities of chemicals. Such agents as are required spread themselves at the particle surface or form dilute solutions in the system liquor, and temperature control is not critical. The process is therefore peculiarly adapted to the continuous treatment of large quantities of low-grade material. A few examples will illustrate how flotation has affected the normal conceptions of ore reserves and the price of the finished material.

Much copper is now mined from ores containing as little as 0.6 to 0.75 per cent copper and in which the metal is finely disseminated as a sulphide. If an ore of such grade were smelted directly, most of the copper would go into the slag and be irretrievably lost; and if it



Colloid Chemistry

Fig. 3. Three test-tube solutions illustrating the separation of marmatite (or ferruginous zinc sulphide) from calcite. The test tube at the left illustrates separation by floating the calcite, and separation by floating the marmatite is illustrated in the center. At the right is an example of lack of separation in the absence of a flotation agent. Note that in the cases in which flotation agents are employed, good separation is achieved.

were concentrated by gravity, very large losses would be incurred and a poor concentrate would result. The alternative ways to dress such an ore are leaching and flotation, and the latter is cheaper because no reagents are required to dissolve and precipitate the metal. The flotation process has made possible the large low-cost open-pit copper mines of the western United States and has kept the price of the metal to about 12 cents a pound in the face of growing costs and a lowered grade of the ores.

A second example is provided by the cement industry. Lime, alumina, and silica have to be blended in the proper proportion to make cement. Most cement rock contains all three ingredients, together with certain impurities, but the desired ingredients are not in the right proportions. It had been customary, therefore, to mine the rock selectively, blending its products with other chosen materials, frequently from a distant locality, and to grind, fire, and again grind the mixture to obtain the finished cement. By the use of flotation it is possible to correct irregularities in cement-rock analysis on a subtractive basis and thus avoid the necessity for blending, selective mining, and transporting one or more of the ingredients. Cheaper and better cement is thus made possible.

The third example of the way in which flotation has altered operations is in the refinement of potash crudes. Potassium chloride occurs in admixture with common salt, certain sulphates, and minor quantities of clay. The traditional method of purification involves dissolution and crystallization through the use of controlled heating and cooling. This method has been replaced by flotation because the latter does not require heat and yields suitably granular potash salt in proper purity.

The progress that has resulted in the major industrial shifts, of which the above examples are typical, has been accomplished in part empirically and in part because of a better understanding of those phenomena of physical chemistry, surface chemistry, and crystal chemistry which make particle discrimination possible.

Surface Chemistry in Flotation

We have learned that a gas-adhesive surface is one that is rather indifferent to the character and composition of the adjoining fluid. It is perhaps most usefully regarded as a surface in which the atoms are not bonded to the water nor seeking to be bonded to it. A gas-adhesive surface is provided, for example, by a paraffin or naphthalene surface—in general, by a hydrocarbon surface. On the contrary, a water-adhesive surface is one in which the surface atoms are really ions or are atoms which were bonded by primary valence to other atoms from which they have been torn by force. Clearly, there is an intimate relationship between crystal chemistry and gas-adhesivity. Fig. 4 shows the behavior of a gas bubble toward a water-avid surface, and Fig. 5, that toward a gas-adhesive surface.

A second important element in our understanding of the mechanism of flotation is provided by the role played

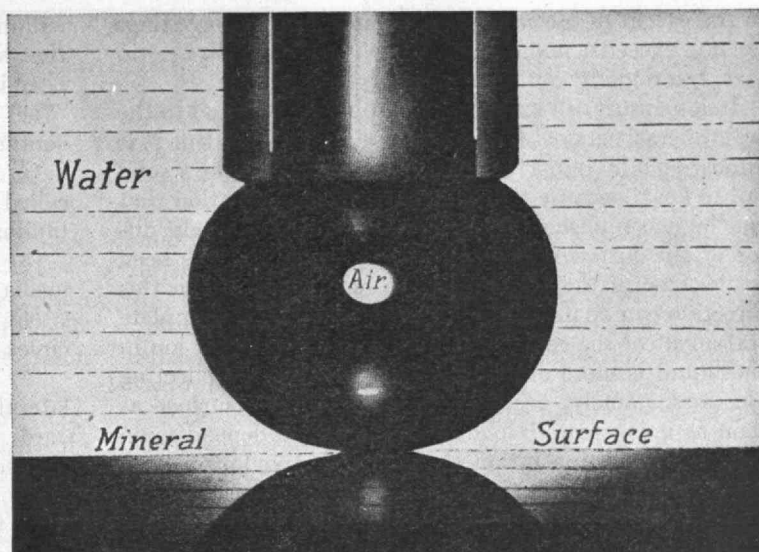


Fig. 4. Whether particles will attach themselves to air bubbles and float is determined by the contact angle between the bubble and surface. The negligible contact angle between air and clean galena in water indicates a water-avid surface, or non-floating condition.

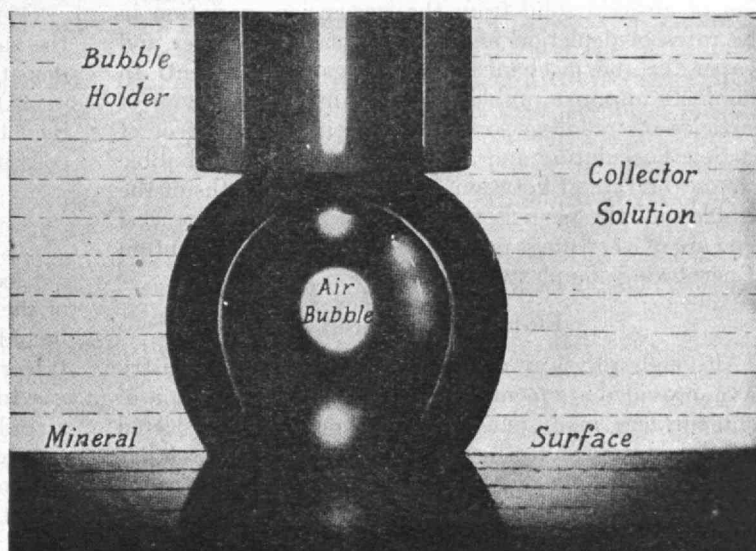


Fig. 5. The contact angle of 60 degrees between mineral surface and bubble designates a gas-adhesive surface. In this case, galena, in a solution of potassium ethyl xanthate, will adhere to the air bubble. These two illustrations are from *Principles of Flotation*, by I. W. Wark, Australasian Institute of Mining and Metallurgy.

by chemical agents in making particles air avid. These agents, or collectors, are generally organic ions such as are provided by organic salts, acids, or bases; the effective ions consist of a hydrocarbon chain to which a reactive group (for example, $-\text{SH}$, or $-\text{C}=\text{O}$) is co-

OH

valently fastened. It has been demonstrated that the collector ions change places with other ions (such as hydroxyl, sulphate, or carbonate) already at the water-wetted surface. The displaced ion may have been of the same kind as occurs within the particle affected, or it may have been of a different kind, previously adsorbed by the particle.

A further understanding of flotation processes is made possible by measurements of the thickness of collector coatings. Early opinions notwithstanding, measurements

of the extent of the surface have shown that the coatings do not exceed a mono-ionic layer. The surfaces are, in fact, fractionally complete monolayers (Fig. 6).

In a measure, all three of these topics are related to the scientific aspects of selective air-solid adhesion. But it is almost equally important to find out how to make a solid fail to float, because the excellence of the separation that can be accomplished depends upon how completely different the surfaces of the two types of solids have been made. One of the ways in which our knowledge in this direction can be increased is by getting a rather complete statement of the composition of the liquor. Every ion in the liquid is more or less able to do what the collecting ion does, namely, occupy a site at the solid surface as soon as it is vacated. The effects observed depend upon the relative concentration of all the effective ions.

The elementary flotation fundamentals considered so far can be classed as scientific rather than engineering in character, although it is plainly difficult to justify such a classification as a hard and fast rule. There are, however, certain points of interest which are more nearly engineering than scientific in character. The engineering problems relate, for example, to such topics as rates of depletion of air-avid solid from the suspension, variation in the rates of depletion for particles of various sizes and shapes, or the mechanism of solid-gas attachment. In this field, also, are problems concerning the behavior of particles of middling surface composition, the effect of particle flocculation and dispersion, the effect of bubble size on the rate of flotation, as well as the lengths of the bubble and the particle paths. Problems of this general type are of very great practical importance and are often of perplexing complexity.

Flotation Research

Although physical chemistry and crystal chemistry have provided some understanding of the behavior of solid surfaces, many questions remain as yet unanswered and thus provide a fertile field for research. Research has a bearing not only on the engineering use of controlled surfaces but also on the science of surfaces — that most

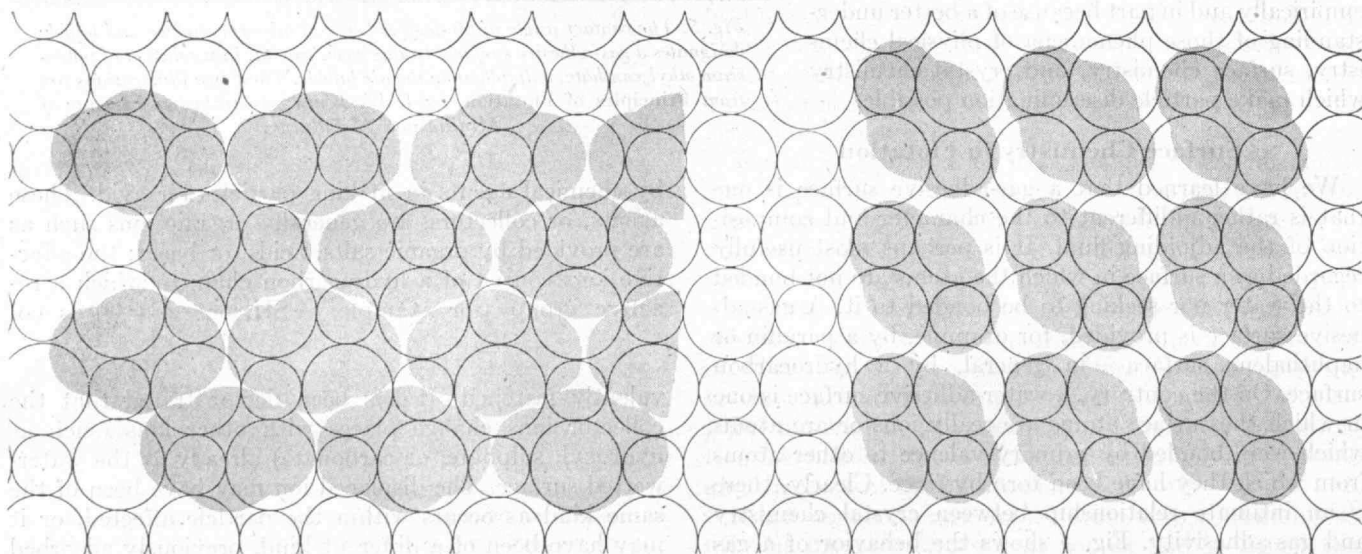
baffling region of physical systems. A few of the questions that suggest themselves may be apropos in providing a peep into future trends:

- (1) Which pure nonhydrocarbons are floatable if uncontaminated?
- (2) Is it true that organic compounds containing so-called "hydrogen bonds" are not floatable if uncontaminated?
- (3) To what extent is flotation possible in nonaqueous media?
- (4) Do cationic collectors operate according to the principles established for anionic collectors?
- (5) Do collector ions adsorbed at surfaces possess lateral mobility?
- (6) What is the proof that adsorbed collector ions are situated at definite loci?
- (7) Are collector coatings so systematic as to constitute truly two-dimensional crystals?
- (8) Is the high adsorbability of collector ions due to some peculiar properties of two-dimensional crystals?
- (9) Can direct proof be obtained to supplement indirect inference that collector coatings are orientated with the hydrocarbon end away from the solid surface?
- (10) To what extent do the relative concentrations of the various ions in the flotation liquor control the relative densities of these ions at the solid surface?
- (11) Is it possible to construct an apparatus that will read the ion concentration in a dilute liquor and to record it continuously if the liquor is changing?

Flotation — A Chemical Engineering Unit Operation

Clearly these various problems require the application of the newest methods of modern physics and chemistry, including electron diffraction, the use of radioactive tracer atoms, surface measurement by low-temperature gas-adsorption, in addition to many of the methods already widely used in mineral dressing research.

In conclusion, let us recall that the successful application of trained bubbles to the selection of particles is essentially a problem in chemi- (Concluded on page 504)



Gustav Preller

Fig. 6. Arrangements of xanthate ions (shaded areas) at galena surface. The lead atoms are represented by the small circles, the sulphur atoms by the large circles. This diagram illustrates the present belief that lack of register between coat and substratum (left) is unlikely as it would call for nonselectivity in adhesion, whereas when coat and substratum are in register a good reason is apparent for formation of an effective coating. The distance, center to center, between nearest lead atoms is approximately 4.19 Å.

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

Industrial Management

THE appointment of Douglass V. Brown as Sloan professor of industrial management in the Department of Business and Engineering Administration has been announced by President Compton.

The new chair of industrial management is endowed by a gift of \$350,000 which was presented to the Institute last year by Alfred P. Sloan, Jr., '95, chairman of the board of General Motors Corporation. The program which this gift makes possible has as its objective the advancement of professional education for executive and administrative responsibility in the wise and skillful industrial management of American business enterprise.

Dr. Compton also announced the establishment of a Sloan lectureship in industrial management closely related to the work of the new professorship. During each academic year a small group of outstanding industrial leaders will be invited, on short leave from their companies, to make direct contributions to the program in such fields as production, industrial management, and the relations of business to government. The lectureship is expected to maintain close and important contacts with actual experience in the field of business and in so doing to contribute its part in raising the standard of American business management and in meeting the challenge of the difficult times ahead.

"The complex problems of return to an economy of peacetime production," Dr. Compton said in announcing Professor Brown's appointment, "leave no doubt of the need for a better understanding of the fundamental factors of human relationships and business administration in American industry. The nation is now confronted with questions of readjustment and reconstruction which in

many respects are more difficult to answer than those arising from the war itself.

"Professor Brown's appointment as Sloan professor of industrial management will strengthen and expand by research and instruction a program which is already well established at the Institute.

"Professor Brown will have the assistance of an inter-departmental committee, of which he will be chairman, composed of Professor Erwin H. Schell, '12, Head of the Department of Business and Engineering Administration, and Professor Ralph E. Freeman, Head of the Department of Economics and Social Science. This committee was established to co-ordinate the research and teaching activities of the two Departments in those areas of economics and business administration in which there is a common interest. It will also explore the possibilities of research along new lines and encourage investigations in those fields that seem most promising. The committee will have the additional responsibility of developing teaching programs that will most effectively serve the needs of all Departments in the Institute."

Professor Brown joined the staff of the Institute in 1938 as assistant professor of industrial relations and was made associate professor in 1940 and full professor in 1943. He is a native of Wilkes-Barre, Pa., and was educated at Harvard University, where in 1925 he received the degree of bachelor of arts. A year later he completed the work for the master's degree in arts and continued in graduate work, which led to the degree of doctor of philosophy in 1932. From 1927 to 1933 Professor Brown was instructor in economics at Harvard University, and from 1933 to 1938 he was assistant professor of medical economics in the Harvard Medical School.

In 1940 Professor Brown was appointed consultant to

Captain Lybrand P. Smith, United States Navy (retired), Professor of Naval Engineering in the Department of Naval Architecture and Marine Engineering, receives the Legion of Merit from Captain William H. Buracker, '30, commanding officer of Naval Training Schools at the Institute, for "exceptionally meritorious conduct in the performance of outstanding services to the government of the United States as assistant co-ordinator of research and development."





Captain Charles D. Wheelock, '23, appointed professor of naval construction as of May 1

the United States Department of Labor and was consultant to the War Department from 1942 to 1943. He held various positions with the advisory commission to the Council on National Defense and the Office of Production Management in 1940 and 1941. In the latter year he was a member of the staff of the Harriman-Beaverbrook mission to Russia. From 1944 to 1945 Professor Brown was a public member of the New England Regional War Labor Board. He has served as an impartial arbitrator under numerous agreements between management and labor unions.

Naval Construction

CAPTAIN CHARLES D. WHEELOCK, United States Navy, who is affiliated with the Class of 1923, has been appointed professor of naval construction in the Department of Naval Architecture and Marine Engineering and came to his new post in May under orders of the Navy Department.

As professor of naval construction Captain Wheelock will take charge of the graduate course for naval constructors and engineers, which has been given to selected officers of the United States Navy and Coast Guard and foreign navies for a number of years. The former head of this course was Professor Henry E. Rossell, '15, who was given a leave of absence in April, 1943, to serve as president of the Cramp Shipbuilding Company in Philadelphia and who has now resigned. During this period Professor George C. Manning, '20, has been in active direction of the course in addition to performing his regular academic functions as professor of naval architecture.

Captain Wheelock brings to his new post a broad fund of engineering experience gained by many years in the Navy, including the critical war years during which he helped develop the latest designs and techniques. He is an authority on ship design and was on duty in the design branch of the Bureau of Ships from 1936 to 1944 and was head of design from 1943 to 1944, when he became production officer at the Mare Island Shipyards. His experience includes not only design but the construction and repair of all types of naval vessels, which became important responsibilities of the Navy during the war.

Captain Wheelock is a native of Riverside, Calif., where he was born in 1897. He entered the United States Naval Academy in June, 1917, and was commissioned an ensign in June, 1920. He did graduate work in naval construction at the Institute and in 1924 received the master's degree in naval construction.

Academy Seats

ON April 24, at the close of its spring meeting, 29 leaders in science, including two Alumni and one staff member of the Institute, were elected to membership in the National Academy of Sciences. Highest honors in the field of science were thereby accorded to Frederick E. Terman, '24, professor of electrical engineering at Stanford University, Kenneth T. Bainbridge, '25, professor of physics at Harvard University, and George Scatchard, Professor of Chemistry at M.I.T.

Dr. Terman received the degrees of bachelor of arts and electrical engineer from Stanford University in 1920 and 1922, respectively, and the degree of doctor of science from the Institute in 1924. Since 1925 he has been in the department of electrical engineering at Stanford University, where he became professor of electrical engineering and executive head of the department in 1937. From 1942 until the end of the war he was director of the Radio Research Laboratory at Harvard University, where radar countermeasures were developed. He was also a member of the National Defense Research Committee during the war. He has published numerous papers on electrical communication topics and several books on radio engineering. In 1940 he was vice-president and in 1941 president of the Institute of Radio Engineers.

Dr. Bainbridge studied at M.I.T. and received the degrees of bachelor of science and master of science in 1925 and 1926, respectively. From Princeton University he received the degree of master of arts in 1927 and, two years later, the degree of doctor of philosophy. From 1929 to 1931 he was a National Research fellow in physics, from 1931 to 1933, a fellow of the Bartol Research Foundation, and in 1933 and 1934, a Guggenheim Memorial Foundation fellow. In 1934 he became assistant professor of physics at Harvard University, was advanced to associate professor in 1939, and will become a full professor as of July 1. From 1937 to 1940 Dr. Bainbridge was associate editor of the *Physical Review*, and during the war he was consultant for the National Defense Research Committee. He received the Louis Edward Levy Medal of the Franklin Institute in 1933.

Dr. Scatchard received the degree of bachelor of arts from Amherst College in 1913 and the degree of doctor of philosophy from Columbia University in 1917; he was a Goldschmidt fellow at Columbia in 1915 and 1916. He

taught chemistry at Columbia between 1914 and 1917, was associate professor of chemistry at Amherst from 1919 to 1923, and then came to the Institute as a National Research fellow and in the following year joined the M.I.T. Faculty as assistant professor. He was made associate professor in 1926 and professor in 1937.

In 1931 and 1932 Dr. Scatchard was a Guggenheim Memorial Foundation fellow. He was associate editor of the *Journal of Chemical Physics* from 1941 to 1943 and has been associate editor of the *Journal of the American Chemical Society* from 1943 to the present time. During the war Dr. Scatchard devoted half his time to working on the fractionation of the plasma proteins for military purposes. Since February, 1943, he has spent half his time with the S. A. M. (Substitute Alloyed Materials) Laboratory of the Manhattan Project, directing research on the fractionation of uranium isotopes.

Medical Director

THE appointment of Dr. Dana L. Farnsworth, now director of health at Williams College, as director of the Medical Department at the Institute was announced recently by Dr. Compton.

Dr. Farnsworth, who will join the staff of the Institute next autumn, will succeed Dr. George W. Morse, who will retire at the end of the year. Dr. Morse has been medical director of the Institute since 1920, and under his administration the Medical Department has grown from a one-room building, which served as a first aid station during the construction of the Technology buildings, to the well-equipped Homberg Memorial Infirmary, which provides the most modern medical facilities for the students and staff of the Institute.

Under Dr. Morse the Department has developed to the point where a full-time medical director is necessary, and Dr. Farnsworth will devote his entire attention to the Institute's medical program which not only takes into consideration medical treatment but offers expert guidance in the care and conservation of physical and mental resources. Prevention of illness is stressed in the Institute's health program, and students and staff are encouraged to avail themselves of its facilities for the slightest indisposition. Last year, through alterations and remodeling, the capacity of the infirmary was increased to 39 beds.

In addition to its facilities for general medical service, the Department maintains psychiatric, dental, and eye clinics as well as complete x-ray and pathological laboratories and a modern operating room. The medical director is assisted by a staff of physicians and nurses.

Dr. Farnsworth is a native of Troy, W. Va. He was graduated with the degree of bachelor of arts from West Virginia University in 1927 and continued his work to win the degree of bachelor of science in 1931. From 1927 to 1929 he taught chemistry and physics in the high school of Barrackville, W. Va., and then entered the Harvard Medical School, from which he was graduated in 1933. Dr. Farnsworth served his internship at the Massachusetts General Hospital from 1933 to 1935, when he became assistant resident in the sanatorium division of the Boston City Hospital in Mattapan. He holds the diploma of the American Board of Psychiatry and Neurology. From 1935 to 1945 Dr. Farnsworth was assistant director of health at Williams College and was granted a

leave of absence to enter the medical corps of the Navy, in which he served as a commander on active duty from 1941 to October, 1945. During this period he was on the neuropsychiatric staff of naval hospitals in Philadelphia, Pa., Oakland, Calif., Bethesda, Md., and Palm Beach, Fla. From 1942 to 1943 he served as a medical officer on the U.S.S. *Solace* in the South Pacific.

Dr. Farnsworth is a member of Alpha Sigma Phi, Phi Beta Pi, and Phi Lambda Upsilon fraternities.

Technology of Peace

ALUMNI DAY, Saturday, June 8, will provide the first opportunity since the ending of the war for M.I.T. graduates to inspect exhibits portraying the Institute's contributions in winning the peace, to renew the pre-war custom of attending symposia on a topic of current importance, and to partake of the popular Stein-on-the-Table Banquet.

The theme of this year's Alumni Day Symposium will be "The Technology of International Peace." Following luncheon in Du Pont Court, the symposium will be held at 2:30 P.M. in Morss Hall of Walker Memorial. In commemoration of the centennial of the birth of Thomas A. Edison, whose life work was dedicated to peaceful technological progress, the symposium chairman will be Charles Edison, '13, President of Thomas A. Edison, Inc., formerly Secretary of the United States Navy, and ex-governor of New Jersey.

That science and technology will be required to play a role in peacetime as important as that which it took up during the war will be emphasized by symposium



Dr. Dana L. Farnsworth will join the Institute's staff next fall as director of the Medical Department.

speakers, each of whom will discuss a separate phase of the technology of international peace. Symposium speakers will be:

Vannevar Bush, '16, President of the Carnegie Institution of Washington, Director of the Office of Scientific Research and Development, and formerly Dean of Engineering and Vice-president of the Institute, will deal with the limitless opportunities for technology to contribute to peace.

Henry A. White, President of the Hawaiian Pineapple Company, Honolulu, T. H., will draw on his experience in food production in the Orient to discuss recent advances in food technology.

Norman J. Padelford, Professor of International Relations at the Institute, consultant, Department of State of the United States, member of the United States Delegation to the Dumbarton Oaks Conference, and executive officer, San Francisco United Nations Conference, will discuss international relations in a technological age.

At 7:00 P.M. the Hotel Statler in Boston will be the scene of the Stein-on-the-Table Banquet where, as usual, seating will be by classes. An invitation is extended to the wives of Alumni to attend the banquet and other Alumni Day activities.

The banquet address, "Looking Forward from a 50-Year Background," will be given by Paul W. Litchfield, '96, chairman of the board, Goodyear Tire and Rubber Company, Inc. President Compton will also address Alumni on peacetime problems confronting the Institute.

Arrangements for Alumni Day are under the general direction of William L. Campbell, '15, chairman. Chairmen of committees are: *Ladies*: Mrs. Leicester F. Hamilton; *Ways and Means*: Horace S. Ford; *Transportation and Hotels*: Emmons J. Whitcomb, '11; *Publicity*: Ralph T. Johe, '28; *Exhibits*: Herbert L. Beckwith, '26; *Arrangements for Symposium*: Edward R. Schwarz, '23; *Luncheon*: John B. Wilbur, '26; *Banquet*: Parke D. Appel, '22; and *Registration*: Wolcott A. Hokanson.

Nautical Decade

THIS spring marks the tenth anniversary of the M.I.T. Nautical Association; it also establishes a new milestone in the career of the Inter-Collegiate Yacht Racing Association, for it was through the facilities offered for sailing at the Institute that the I.C.Y.R.A. and college sailing as a sport have prospered during the past decade.

Although college yacht clubs are not a particularly new development (such organizations existed at Brown, Harvard, M.I.T., and Yale in the Nineties), their activities were largely social, and they died out after World War I. During the Twenties, Princeton, Harvard, and Yale held annual races on Long Island Sound. In 1931-1933 "frost-bite" dinghy racing skyrocketed to popularity, and collegiate sailing became firmly re-established.

By 1935 Erwin H. Schell, '12, Head of the Department of Business and Engineering Administration — who had long been interested in seeing the Charles River Basin used for water sports other than crew racing — the late Henry A. Morss, '93, George Owen, '94, Professor Emeritus, Walter C. Wood, '17, and John C. Austin, '36, became instrumental in organizing the M.I.T. Nautical Association. To aid in fostering sailing activities on the Charles River, President Compton arranged a meeting of prominent Boston yachtsmen, including graduates of Harvard as well as of M.I.T. The Nautical Association was born at this meeting, and the Institute was promised gifts of several boats. Originally a dozen or more dinghies were to be housed in the Technology crew boathouse, but the plan met with such enthusiastic response that long before the spring of 1936 a fleet of 37 dinghies, designed by Professor Owen, had been subscribed. In addition, funds for building a boathouse had been obtained. With such active support other boats were soon added until the M.I.T. sailing fleet numbered 46 boats.

The primary purpose of the M.I.T. Nautical Association was to provide recreational sailing and training for Technology students, and it quickly fulfilled that purpose. In the first year more than 500 students took advantage of the facilities offered, and the number of participants increased steadily until by 1941 there were more than 900, or about one-third of the entire student body. Records show that during these years boats were in use in excess of 16,000 man-hours of sailing annually.

Students not only were taught to sail a boat but were given a sound course in seamanship under the able direction of Walter C. Wood, sailing master. Before the first dinghy
(Continued on page 506)



Under the jurisdiction of the M.I.T. Nautical Association, dinghy sailing for students and staff completes a decade of popular outdoor relaxation.

REVERE COPPER IN FEDERAL 200 KW TUBE

THE 200 KW vacuum tube made by Federal Telephone and Radio Corporation is the most powerful h-f tube yet built in this country. It has been used in OWI short-wave transmitters and has demonstrated its capabilities as to power output, and dependability.

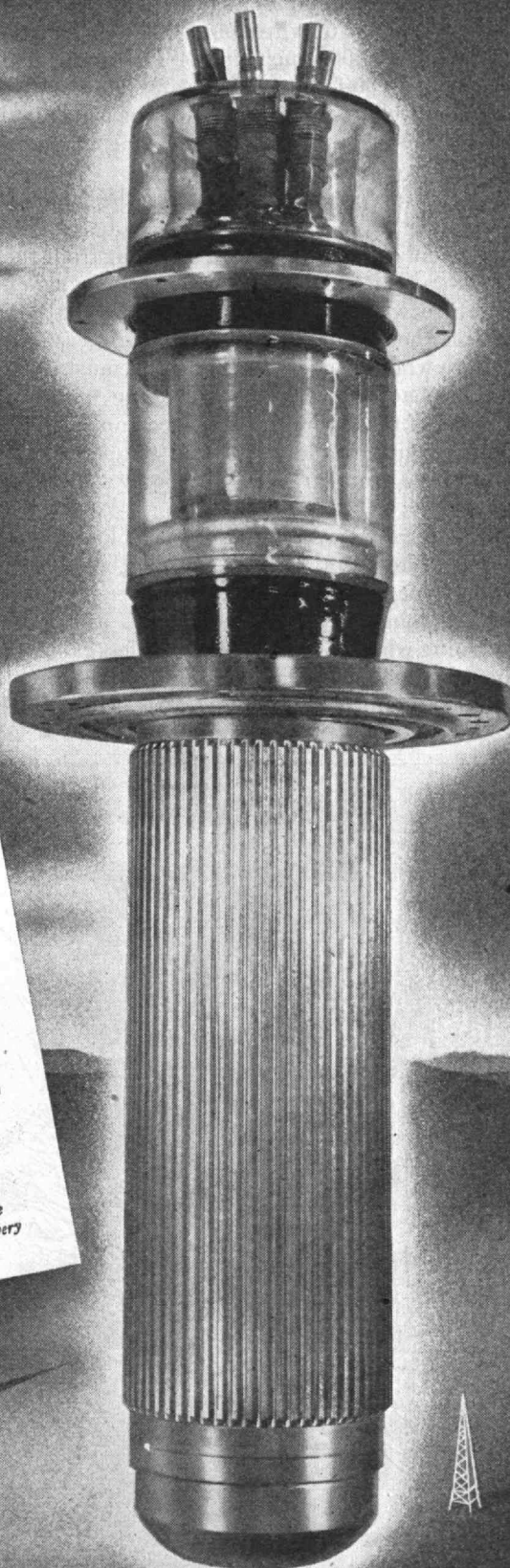
Revere OFHC (Oxygen-Free High Conductivity) Copper is one of the principal materials used in the tube. The anode is machined from a large tube of this material, which is also employed in the form of heavy sheet for making the cup that closes the anode at the bottom, in the form of strip for drawing the terminal cups. All copper used in the tube is from Revere, which thus again demonstrates its ability to meet the most rigid requirements as to electrical and thermal conductivity, workability and uniformity. For high-quality copper and brass for radio purposes, see Revere.

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Federal 134 Transmitting Tube, 200 KW oscillator and amplifier; length, 34-1/8".

HIGH ROAD TO BROOKLYN

(Continued from page 490)

stated that "the Engineer considers it absolutely necessary that every ring should undergo a test when finished." (A "ring" was a coil of wire about 840 feet long; there would be about 100,000 such rings.) Thousands of tests were necessary, in 50-foot, five-foot, and one-foot lengths for tension, as well as a bending test, which required the winding of a one-foot length from each ring around a rod one-half inch in diameter.

For two years preparations for starting the cabling had been under way. Each cable was to be an integral structural member, two thirds of a mile long from anchorage to anchorage; it would be sensitive to varying effects of temperature, wind, and uneven distribution of the moving loads on the bridge. To take its share as a part of the cable as a whole, each of its small wires must be strung with a sag to accord with the prevailing temperature. The stringing of these wires must be accomplished during the widely varying winds, rains, and temperatures of a northern climate, from an aerial temporary structure over a busy river.

The 680-ton cables were too heavy and long to be put together alongshore and erected from flatboats, as were the four and one-half inch diameter cables of the earlier Roebling Monongahela Bridge. Instead, a steam-propelled spinning wheel, attached to an endless cable, which was driven by a steam engine located near the Brooklyn tower, carried bights of wire across the river from anchor-

age to anchorage to make one strand. Nineteen strands were squeezed to the circular form of one main cable.

It is hard to imagine any other construction process involving such painstaking adjustment of such ultimately huge members as the regulation of the individual wires and the strands of a suspension bridge cable. The closest teamwork by men at the anchorages, on the towers, and along the cable over the channel and land spans was necessary. Today such work is made easier through the use of telephones and dozens of electrical signal circuits. A control house is located in the center span, with gauges and dials, and sag readings are facilitated by the use of illuminated level-rod targets. Motors do the work, and the men record their readings, comparing them with the tables of sags according to temperature. It is still a conscientious task, as guide wires are adjusted to serve as a standard for the remaining wires of the strand, as the strands are adjusted and shifted to final position at anchorages, and as the strands are transferred to the tower-top saddles. As we read of 18 men pushing at six wooden levers to transfer a strand to its final position in the tower saddle, we visualize the huge steel balance beams now used for a similar operation and the 150-ton hydraulic pulling jacks at anchorages. Then, as now, the regulating must be done when the sun is not shining, with no wind blowing, and with no rain.

When spliced with the threaded couplings, the wire of any one strand was in effect an endless single wire 189 miles long, which started at the strand shoe-eye at Brook-

(Continued on page 502)



How do you execute a mouse?



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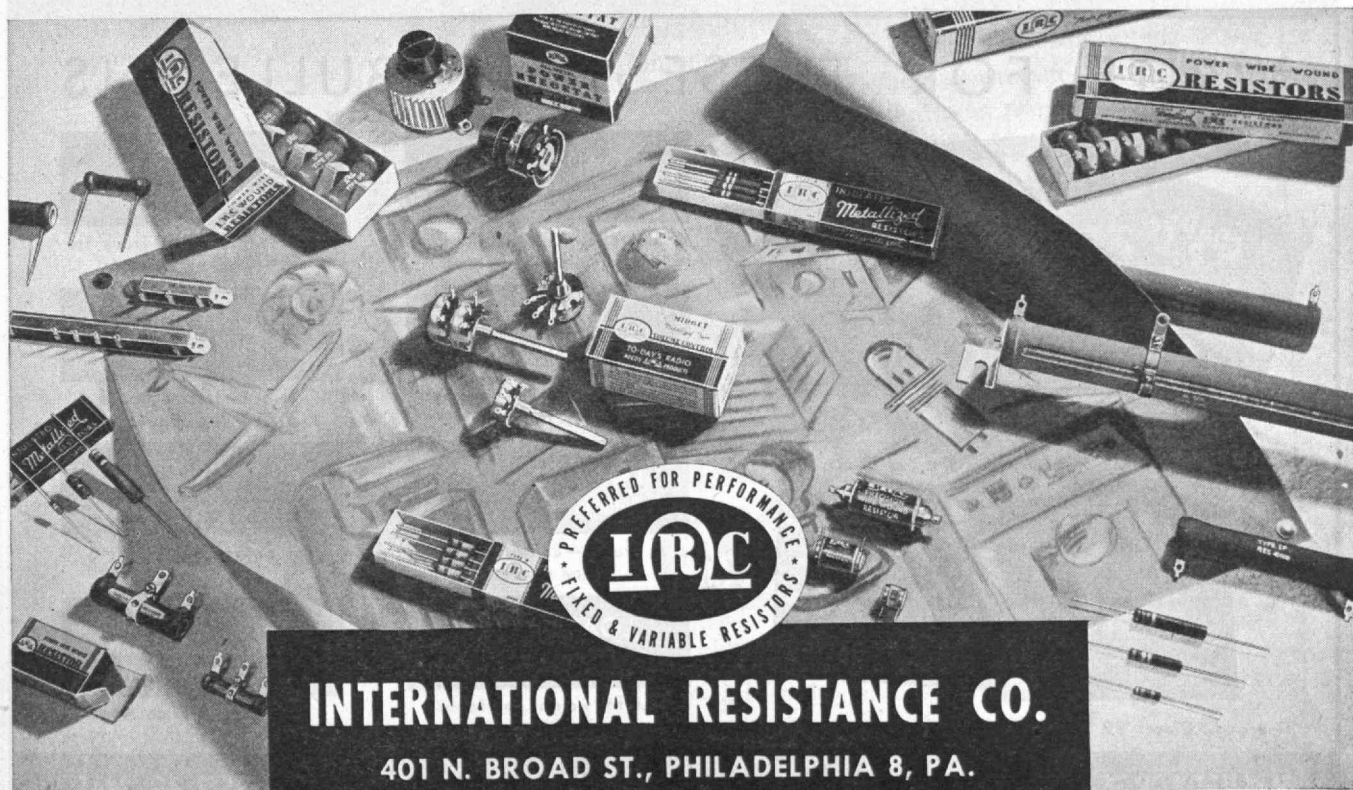
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HIGH ROAD TO BROOKLYN

(Continued from page 500)

lyn, went up over the Brooklyn tower, swept across the river to the New York tower, and descended to the eye of the strand shoe at the New York anchorage, making this circuit 278 times. Disaster came on the fifteenth strand of the uptown cable, when the shifting tackles broke. Two men were killed as the strand screeched along New York rooftops to the tower, then slithered down to the river, and sank, just missing a crowded ferryboat.

The completed strands were squeezed into the 15 $\frac{3}{4}$ -inch cables, which have a steel wrapping that has proved so effective against weather that wires which were recently removed from the cables for testing were found to be preserved in practically the same state as when originally strung.

The Floor System

Lest the unspectacular, light-membered floor system of the Bridge appear as an anticlimax, we should transport ourselves back into the period of its construction and read of the troubles encountered in making the members of steel instead of wrought iron. The Edge Moor Iron Company had steel contracts for 6,700 tons. To explain the long delays the Edge Moor president listed the delayed members: six-inch channels and beams, nine-inch channels, and eyebars for the trusses — all minor sizes today. It was supposed that the eyebars could be made of steel as eyebars of iron had been made, but four months of costly experimenting was required. The company's presi-

dent said, "It may be said without fear of contradiction that the work covered by these contracts is unusual and of extraordinary character."

The plank wearing surface of the roadway had to be renewed about twice a year. With the drivers throwing down lighted cigars on the roadway, which was covered with fine splinters, gouged by the horses' feet, fire protection became necessary. Standpipes were installed, and portable extinguishers were provided for the police, who had to put out several fires.

Of course, the Bridge would have the latest method of illumination: 70 carbon arc lamps of 7,000 candle power each.

Consummation

A spirit of dogged enthusiasm is evident throughout the engineering reports of the resourceful Bridge builders who toiled for 13 years to overcome the hazards of winds, quicksands, and the swift tides of the East River. Even the mounting loss of human lives, which finally reached 20, failed to dampen the engineers' determination to complete to the high standards of their dead chief, John August Roebling, this most famous of all bridges. Not only did they have to meet each engineering difficulty but they had to carry on in the atmosphere of bitter opposition that prevailed from beginning to end — marked by the continued fight for funds, the objections of ship-builders, and the usual caustic comments of shortsighted persons who failed to envision the marvelously beneficial effects on the growth of the metropolis which the Bridge

(Concluded on page 504)



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fuel, they rank among the world's largest and most efficient.

Constructed under war conditions, with time the vital factor, these huge steam generators were designed, built and placed in service in one-half the normal time. It was only ten months after the War Department ordered them that the first unit was producing the power that ultimately resulted in the creation of the atomic bomb.

For this and other contributions to atomic bomb production, Combustion Engineering was one of the companies that was given the Seventh Biennial Award for Chemical Engineering Achievement.

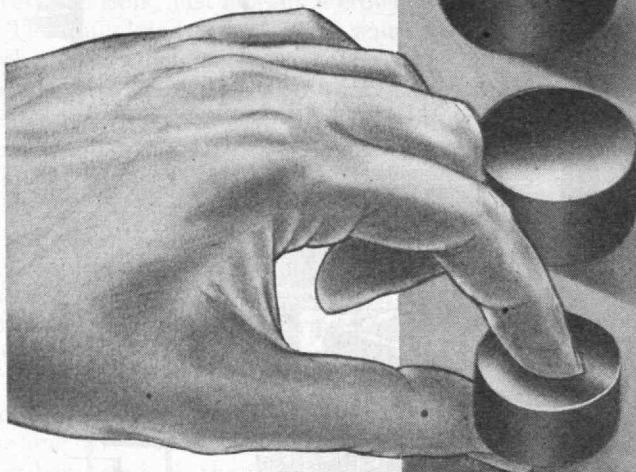
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HIGH ROAD TO BROOKLYN

(Concluded from page 502)

was to provide. It is not for us, however, to criticize our forebears for deficiencies of foresight; rather do we admire them for their courage and perseverance in the face of almost insuperable difficulties and handicaps.

Even within a few months of the Bridge's completion a newspaper editorial asked, "Will It Ever Be Finished?" For more than a decade *Harper's Weekly*, *Scientific American*, and other popular magazines of the period had recorded the difficulties, progress, and problems of constructing the high road to Brooklyn. Views of the Bridge were shown in stereoscopes, which occupied a prominent place next to the red plush family album in the parlors of the 1880's.

Prone for generations to boast of its superlatively huge enterprises, New York looked on the greatest yet with mixed emotions; for many still doubted the safety of the now nearly completed Brooklyn Bridge. In the spring of 1883 came the test, for the Bridge was finished and ready for its dedication.

Pomp marked the opening ceremonies on Bridge Day, May 24, 1883, which was declared a public holiday. There were parades in New York and Brooklyn; sailors bravely manned the yards of the marine procession of Civil War men-of-war which sailed up the East River and passed under the Bridge. The climax came as the President of the United States, Chester A. Arthur, and Governor Grover Cleveland, soon to be president himself, led the procession of notables from New York to meet a similar group of Brooklyn officials at the Brooklyn tower of the Bridge.

A few months later, Jumbo, hugest of all pachyderms, marched across the Bridge at the head of a long line of 27 other elephants, and those citizens of New York who had continued to doubt now had no further fears as to the safety of the Bridge. They could drop their unwonted restraint and boast of their greatest bridge in the world. And did they boast!

The masterpiece of the master bridge builder, John August Roebling, was a success.



DISCRIMINATING PARTICLES AND WORKING BUBBLES

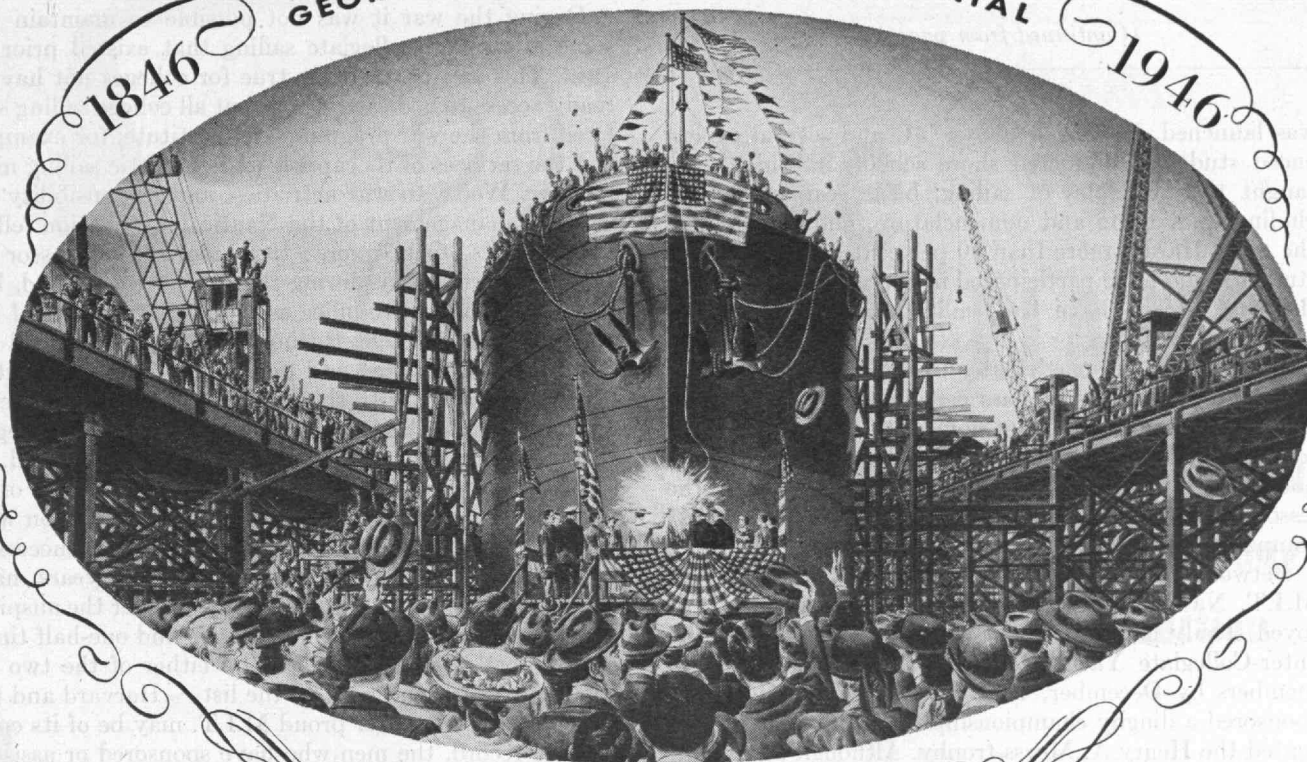
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cal engineering wherein the operation of the flotation unit on sound scientific and engineering bases is co-ordinated with the operation of associated units to produce most economically the desired separations. The flotation process is often classified and taught with mining engineering or metallurgy because of its close relationship to the mineral industry. From time to time, it is useful to view it in its broader aspect as a unit operation of chemical engineering capable of solving problems other than those arising from civilization's unsatiable demand for metals.

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Nearly half a century ago, George Westinghouse developed a revolutionary steam turbine that supplanted the steam engine as a driving force for central station generators.

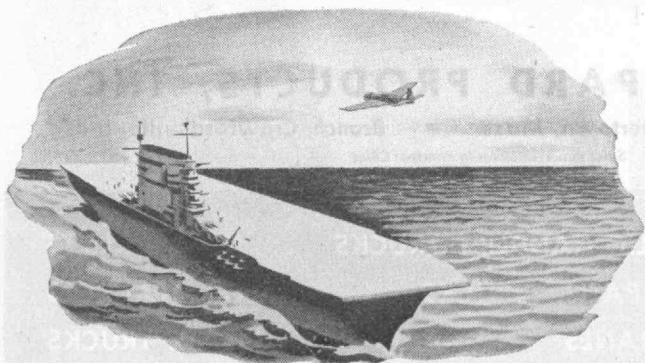
Always vitally interested in better transportation, Westinghouse quickly realized that here was the *ideal power source* for ship propulsion. Because of its compactness, the steam turbine would permit more space for fuel . . . reduce weight and vibration . . . assure far greater fuel economy.

But there was one difficult engineering problem that no one had yet solved—an efficient means for coupling the rapidly whirling turbine shaft with the ship's slow-moving propeller.

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After six long years of study and experiment, Westinghouse built two 3250 horsepower geared turbines which were installed in the collier, U. S. S. Neptune—launched on June 21, 1912.

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THE INSTITUTE GAZETTE

(Continued from page 498)

was launched, Robert W. Vose, '31, and several experienced students conducted shore schools in which were taught the principles of sailing, basic seamanship, including knot tying and nomenclature, and the rules of the road. Hardly more than 10 per cent of the Institute students who have participated in the sailing program in the past decade have had sailing experience prior to entering M.I.T.

Every man who participates in sailing with the Nautical Association has to pass certain tests and advance through various ranks from novice, to crew, to skipper, to racing skipper, to coxswain, and to boatswain, although not all participants reach the higher grades. One of the lessons to come out of the M.I.T. sailing program is that competition breeds good helmsmen.

Between 1936 and 1940 college sailing, in which the M.I.T. Nautical Association played a leading role, enjoyed steady growth. From a membership of eight, the Inter-Collegiate Yacht Racing Association grew to 20 members by December, 1941. In 1937 the I.C.Y.R.A. sponsored a dinghy championship for which M.I.T. presented the Henry A. Morss trophy. Although many dinghy races were held on the Charles River, the I.C.Y.R.A. early adopted a policy encouraging sailing in other localities, and its long-range aim is a single governing

body for college yachting, composed of component members, or district or sectional associations.

During the war it was not possible to maintain the same interest in collegiate sailing that existed prior to 1942. This was particularly true for colleges not having ready access to bodies of water, but all college sailing suffered from the war program. The Institute, for example, lost the services of its capable and energetic sailing master, Mr. Wood, to war activities, and responsibility for wartime management of the Nautical Association fell to Donald C. Stockbarger, '19, Associate Professor of Physics. Particularly during the critical war period, but also during his entire office as secretary-treasurer of the Inter-Collegiate Yacht Racing Association, Leonard M. Fowle, '01, stimulated and maintained interest in inter-collegiate sailing. With the return to peacetime curricula and an unusually large postwar enrollment in the colleges, renewed interest in competitive sailing is anticipated.

Certain rewards have come to M.I.T. as a result of its program of student sailing and its close association with the I.C.Y.R.A. One has been the phenomenal success of M.I.T. sailing teams which, in the past 10 years, have won more than 50 major regattas held under the auspices of the I.C.Y.R.A. This number is two and one-half times the number of victories scored by either of the two institutions who stand next on the list — Harvard and the Coast Guard. However proud M.I.T. may be of its competitive record, the men who have sponsored or assisted in the development of the Nautical Association feel that an even greater and more lasting achievement is in the

(Continued on page 508)

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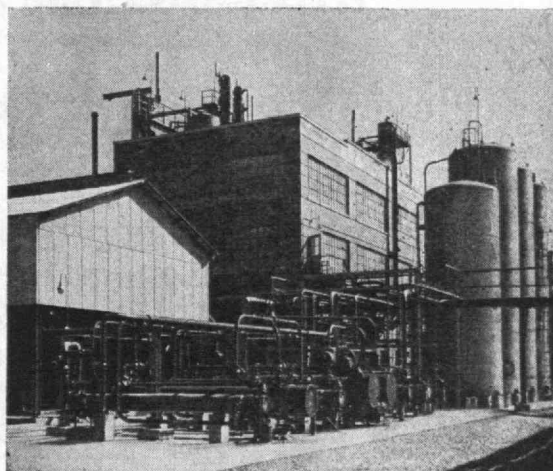
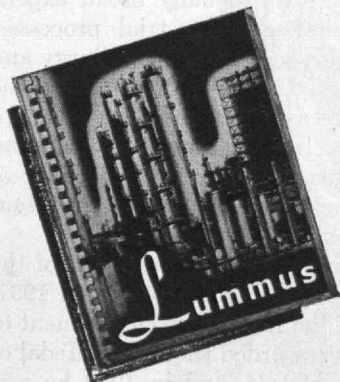
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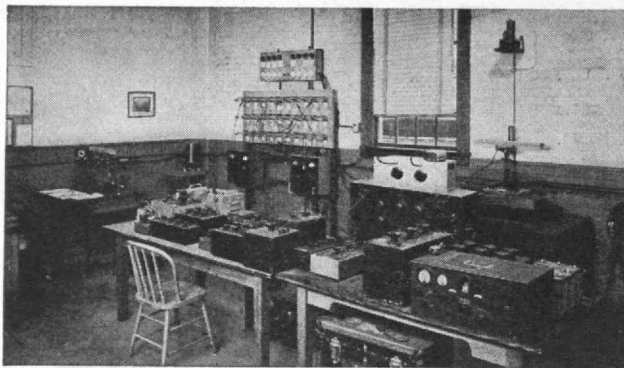
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THE INSTITUTE GAZETTE

(Continued from page 506)

contribution to the development and growth of college sailing throughout the continent. Equally important has been the Institute's gain in obtaining nearby recreational area to supplement its relatively meager grounds in urban Cambridge.

With renewed interest in postwar sailing at the Institute, a number of regattas will be held this spring. Interest in sailing may be expected to take an added step forward this summer since Mr. Wood is expected to return to the Institute in August to resume his activities as M.I.T. sailing master.

Promotion and Retirement

JOHAN CHIPMAN, Professor of Process Metallurgy at M.I.T. since 1937, has been appointed head of the Department of Metallurgy, it was recently announced by President Compton. Professor Chipman will succeed Professor Robert S. Williams, '02, who retires on July 1 after 44 years of service on the Institute's staff.

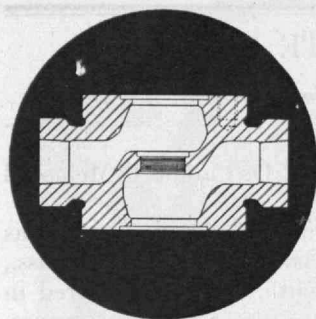
Professor Williams, who was deputy dean of engineering from 1944 to 1946 and has been head of his Department since 1937, is a widely-known authority in the field of metallurgy and has been associated with the Institute as a member of the staff since 1902, the year in which he was graduated from M.I.T. Later he studied abroad and returned to accept a staff position at the Institute. He has been largely responsible for the establishment of Technology's course in physical metallurgy, which includes the heat treatment of alloys and their x-ray examination.

During the war Dr. Williams was a member of the National Research Council's committee on the war uses of beryllium. He was also a member of a metallurgical group attached to the chemistry section of the National Defense Research Committee, which later was joined with the War Metallurgy Committee. From 1942 to 1946 Dr. Williams was metallurgical adviser to the Quartermaster General. As professor emeritus he will continue on a part-time basis in the Department and will serve as dean of Army and Navy students.

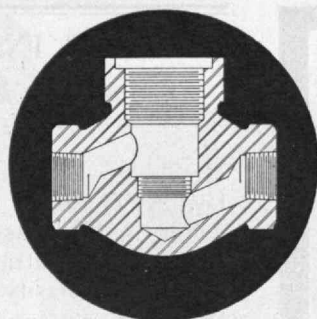
To his new post as head of the Department of Metallurgy, Dr. Chipman brings exceptionally broad experience in technical education and industrial processes. Internationally known for his research in metallurgy and physical chemistry, he directed at the Institute one of the early metallurgical problems associated with the development of the atomic bomb. In 1943 Professor Chipman was given a leave of absence to go to the University of Chicago as chief of the metallurgy section of the Manhattan District Project there.

Dr. Chipman was associate director of research of the American Rolling Mill Company from 1934 until 1937, when he joined the staff of the Institute's Department of Metallurgy. In 1934 he was awarded the Howe Medal of the American Society for Metals, and in 1939 he was chosen to receive the Hunt Award of the American Institute of Mining and Metallurgical Engineers. In 1945 he was elected a director of the American Society for

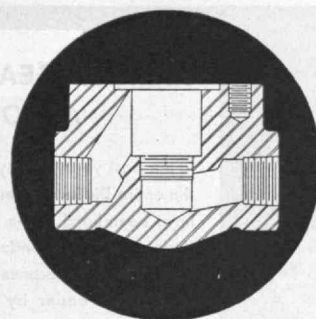
(Continued on page 510)



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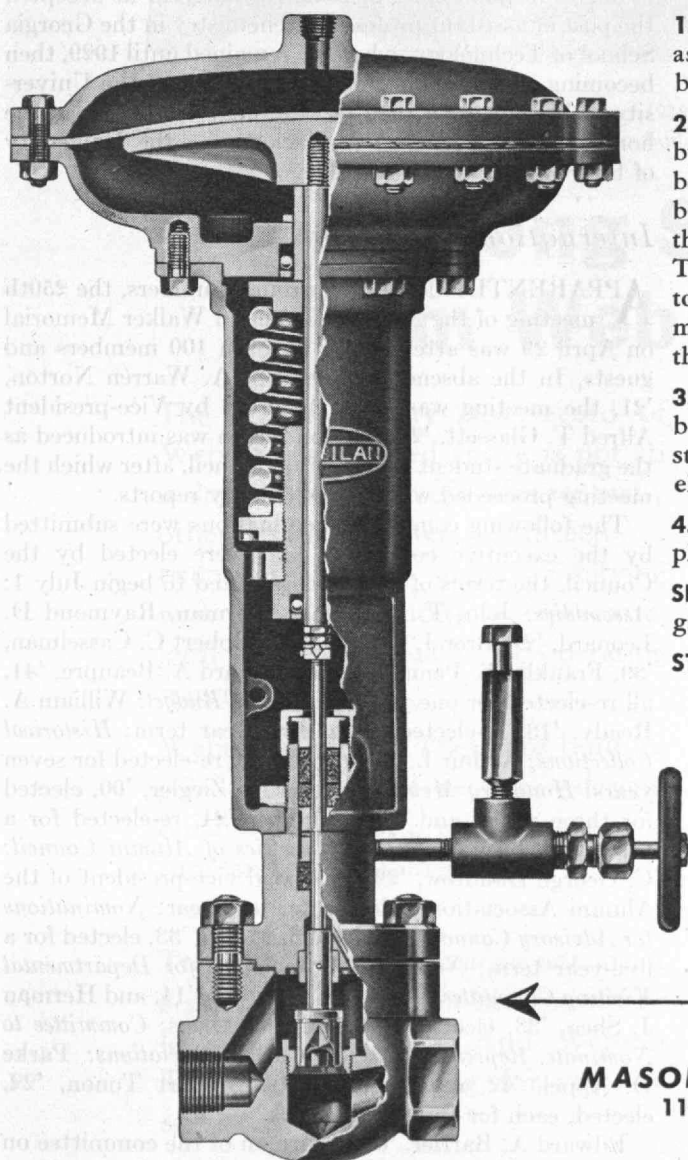
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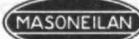
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THE INSTITUTE GAZETTE

(Continued from page 508)

Metals, in which he was the E. D. Campbell Memorial Lecturer of 1942.

Born in Tallahassee, Fla., in 1897, Dr. Chipman was educated at Central High School in Pascagoula, Miss., and the University of the South, which he entered in 1914. Interrupting his college career for war service, he was first a private and then a second lieutenant of Field Artillery and returned to the university in 1919 to complete the requirements for the degree of bachelor of science in 1920. He then took a position as a teaching assistant in chemistry in the State University of Iowa and at the same time carried on graduate work leading to the degree of master of science in 1922.

In 1922 Dr. Chipman was appointed assistant professor of chemistry in Illinois Wesleyan University, a post which he relinquished to become a teaching fellow at the University of California, which awarded him the degree of doctor of philosophy in 1926. In that year he accepted the post of assistant professor of chemistry in the Georgia School of Technology, where he remained until 1929, then becoming a research engineer on the staff of the University of Michigan. In 1940 Dr. Chipman was awarded the honorary degree of doctor of science by the University of the South.

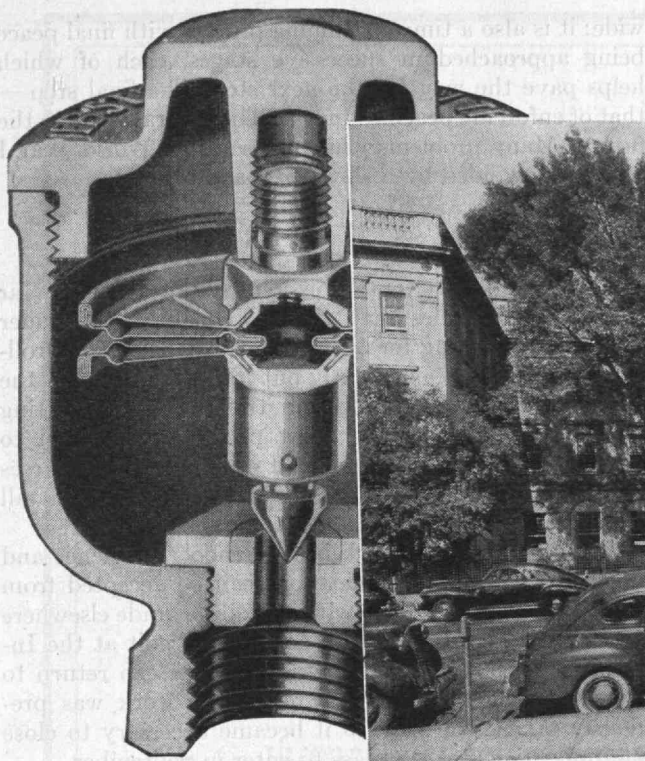
International Relations

APPARENTLY destined for round numbers, the 250th meeting of the Alumni Council in Walker Memorial on April 29 was attended by an even 100 members and guests. In the absence of President A. Warren Norton, '21, the meeting was called to order by Vice-president Alfred T. Glassett, '20. Gordon Hearn was introduced as the graduate student guest of the Council, after which the meeting proceeded with the customary reports.

The following committee nominations were submitted by the executive committee and were elected by the Council, the terms of all persons elected to begin July 1: *Assemblies*: John T. Rule, '21, chairman, Raymond D. Leonard, '27, Bror J. Grondal, '31, Robert C. Casselman, '39, Franklin E. Penn, '40, and Edward A. Beaupre, '41, all re-elected for one year; *Audit and Budget*: William A. Ready, '13, re-elected for a three-year term; *Historical Collections*: Arthur L. Townsend, '13, re-elected for seven years; *Honorary Members*: Percy R. Ziegler, '00, elected for three years, and J. D. Crosby, '21, re-elected for a three-year term; *Increased Activities of Alumni Council*: C. George Dandrow, '22 (as second vice-president of the Alumni Association), elected for one year; *Nominations for Advisory Councils*: Richard S. Morse, '33, elected for a five-year term; *Nominating Committee for Departmental Visiting Committees*: Ernest C. Crocker, '14, and Herman J. Shea, '33, elected for three-year terms; *Committee to Nominate Representatives of Local Associations*: Parke D. Appel, '22, re-elected, and A. Robert Tonon, '22, elected, each for three-year terms.

Edward A. Barrier, '05, chairman of the committee on war record, reported that serious consideration had been given to a war record for World War II. The Committee

(Continued on page 512)



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THE INSTITUTE GAZETTE

(Continued from page 510)

recommended that a separate section be printed in the next issue of the Register of Former Students in which would appear alphabetically the names of all Alumni who were in the service during the war. Information giving the name, class, rank, branch of service, date of entry, date of discharge, and decorations would be included. Alumni who died in the service would be so designated. The report of this committee was adopted.

George Warren Smith, '26, presented a report of the committee on resolutions for the late Winthrop Cole, '87, which was adopted by rising vote.

David G. Black, Jr., President of the senior class and President of the Institute Committee, told of the problems of that committee in the reconversion period. Work of the committee is often being done by students in the younger classes as a result of lack of seasoned students. It is felt that the situation will assume more normal condition when the new term starts in the fall.

James R. Killian, Jr., '26, reported latest activities of the M.I.T. Administration. The budget for the coming year totals about \$6,000,000, the wartime penthouse atop Building 6 is being torn down, and new appointments, recorded elsewhere in this issue, were announced, as was also the Medal for Merit recently conferred upon President Compton.

Vice-president Glassett then introduced Norman J. Padelford, Professor of International Relations, who spoke on "International Relations in a Technological Age." After establishing the status of political scientists, Professor Padelford outlined the aims and objectives of the course in international relations at the Institute. The course is based on the recognition that engineers and scientists will necessarily assume greater responsibilities in national and international problems because technology affects our daily lives in increasing measure. After enumerating the objectives of the course, Professor Padelford discussed certain current international problems, using as background material his experience at Dumbarton Oaks and the United Nations Conference at San Francisco.

Comparing the task of peacemaking today with similar tasks following previous wars serves to illustrate that the task is much more difficult because it is now world-

wide; it is also a time-consuming process with final peace being approached in successive stages, each of which helps pave the way for the next step. The final step — that of enforcing peace — may still be several years in the future. Many problems which arose after World War I are being avoided by a slow approach to peace.

Admissions

APPLICATIONS for admission to the Institute far exceed facilities that will be available, even under the program calling for 50 per cent expansion in enrollment which has been recently put into effect to meet the heavy demand for engineering training. In admitting students to the Institute, first preference is given to former Institute students in good standing whose courses were interrupted by war service. It is expected that all such returning students can be accommodated.

For undergraduate work in the schools of science and engineering no more applications can be accepted from applicants who have done work of college grade elsewhere which would entitle them to advanced credit at the Institute. In nearly all such cases, students can return to the educational institution where their work was previously taken. On May 15 it became necessary to close all applications for the class to enter in September.

It is to be regretted, of course, that these steps, which have been made necessary by the large number of applicants, make it impossible for the Institute to admit many promising students who would otherwise be acceptable. The Admissions Office has received many letters from Alumni on behalf of applicants, often of excellent qualifications, who could not be admitted. This announcement is published so that all Alumni may be informed of the situation and will not feel that particular candidates, in whom they may be interested, are being discriminated against by a ruling which is being applied generally in order to be fair to all.

Training in Civil Engineering

THE Visiting Committee on the Department of Civil and Sanitary Engineering * held well-attended meetings at the Institute on December 3 and 4 and at the

(Continued on page 514)

* Members of the Committee for 1945-1946 are: Thomas C. Desmond, '09, chairman, E. Sherman Chase, '06, Walter D. Binger, '16, H. W. McCurdy, '22, William H. Mueser, '22, and Beauchamp E. Smith.



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THE INSTITUTE GAZETTE

(Continued from page 512)

Union League Club in New York City on January 26.

On December 3 the morning was spent in conference with Professor John B. Wilbur, '26, Acting Head of the Department, and the afternoon was devoted to an inspection of Department facilities. The morning of December 4 was spent in discussion with staff members of the Department. A luncheon at the Smith House was attended by the staff of the Department, the members of the Committee, James R. Killian, Jr., '26, Vice-president of the Institute, Edward L. Moreland '07, Dean of Engineering, Professor Edwin R. Gilliland, '33, and Robert M. Kimball, '33, administrative assistant to President Compton. At the meetings at the Union League Club the Committee's report was prepared and adopted.

Undergraduate enrollment in the Department suffered a serious decline between World Wars I and II. In Civil Engineering there was an almost linear decline of from 71 bachelor of science degrees awarded (average of 1921-1925) to 20 (average of 1936-1940). Undergraduate enrollment in Sanitary Engineering during this period was small, leading to the recent elimination of a separate undergraduate course in that field.

During the same period, graduate enrollment in Civil Engineering was increasing. Before World War I there were 30 to 35 graduate students, and this number held remarkably during the recent conflict. Graduate registration in Sanitary Engineering was small, but with the recent expansion of staff and laboratories in that field there is already some indication of increased student interest.

The increase in the number of undergraduate students in Course I is a problem of major importance, but the staff believes, and the Committee concurs, that it is equally important to control carefully the caliber of these students. For the present, a group of 30 good students in each undergraduate class appears to be a desirable goal. The maintenance of the present graduate enrollment in Civil Engineering and an increase in the graduate enrollment in Sanitary Engineering to a figure of 12 to 16 students are other definite goals.

Among the important factors that have contributed to the decline of undergraduate enrollment in Civil Engineer-

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THE INSTITUTE GAZETTE

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ing are the following: the depression in the private construction industry during the past 15 years; the development of new and more specialized fields that have a more "glamorous" appeal to young men; the initiation of new professional courses at M.I.T.; and the relatively high tuition at the Institute.

There are, however, strong indications that better times are ahead for the civil engineering profession. Private construction of buildings, roads, airports, and stationary structures of almost every type promises to be extremely active over a period of an extended nature. The supply of young, well-trained civil engineers to meet such new needs is comparatively small because for many years the number of young men, the country over, who have entered this field has been limited, and many of those who graduated in civil engineering during the depression went into other lines of endeavor. Better employment prospects for civil engineers appear to be extremely likely. In due time this situation will be reflected in an increasing number of young men wishing to enter the profession. Moreover, it is probable that there will be a temporary increase in students as a result of returning veterans. In the field of sanitary engineering there is evidence of a substantial public interest in the proper disposal of industrial wastes and in waterway sanitation. Further, there is a great need for sanitary engineers in many countries now deficient in sanitation facilities.

Such prospects encourage the Committee to recommend an aggressive and comprehensive program to build up the Department in accordance with the anticipated postwar expansion of the civil engineering profession.

The Institute must offer courses in civil and sanitary engineering that cannot be surpassed by those of other schools. If the education offered at M.I.T. is clearly equal or superior to the best otherwise available, the Committee believes that high tuition will be no barrier to good men, especially in view of the Institute's resources for student aid.

Such a program involves a first-class staff of teachers with capacity for professional growth and the vigor to meet problems squarely. It needs the best laboratories for educational and research purposes. It needs a curriculum designed to benefit selected students, one that places emphasis on the fundamentals of applied science rather than on vocational subjects, that does not permit too much specialization in undergraduate work, and that recognizes responsibility in aiding students to develop their personal as well as their academic qualities.

The Committee appreciates the fact that it has been necessary to close the Technology summer camp in recent years because of war conditions but urges that it be re-established as soon as possible.

The Committee recommends the following five steps toward the culmination of the envisioned goal:

1. In fostering the construction of a new hydraulics laboratory at as early a date as is feasible, Technology will perform a service of national importance. The initial development (including a naval towing tank) should be housed in a building 75 feet by 160 feet. If sufficient funds

(Concluded on page 518)

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THE INSTITUTE GAZETTE

(Concluded from page 516)

for the initial development are not immediately available, it seems better to proceed at this time on a limited basis by building the laboratory so that it is adaptable to future expansion, rather than to postpone construction for an indefinite period while a larger sum is sought.

The Department of Naval Architecture and Marine Engineering will be especially concerned with the towing tank to be included in the new hydraulics laboratory, and students from other Departments will also use the general facilities of the laboratory.

2. The early completion of the Sedgwick Laboratories of Sanitary Science is urged, thus giving full backing to the Institute's new program in sanitary engineering, which is potentially capable of achieving national distinction.

3. Research in the cement and concrete laboratory of this Department should be resumed at an early date. By offering opportunities for student research, the reinitiation of this activity will complement the teaching of the design of reinforced concrete structures in the Department. Moreover, fundamental research in cement and concrete by properly qualified staff members will be of importance in bringing the Department to the front as an educational and research unit of the Institute.

4. The establishment of a photogrammetry laboratory is necessary to keep in progress with the growth of aerial surveying methods as a result of the recent war. It will assist in the instruction of both undergraduate and graduate courses in surveying.

5. Every effort should be extended toward establish-

ing relations with the United States Service Schools which will lead to the sending of outstanding graduates of those schools to the Institute for graduate study in civil and sanitary engineering. All branches of the service should supply sanitary engineering students. The need for adequately trained sanitary engineering officers has been thoroughly demonstrated in the recent war.

The Committee also gave consideration to certain overlappings that occur between subjects taught by this Department and by other Departments. As an example, the teaching of hydraulics as a service course for other Departments was formerly carried out as one of the important functions of the Department. In recent years, much of this activity has been discontinued because of the teaching of fluid mechanics in other Departments. It is hoped that as the strengthening of the Department continues, arrangements can be worked out that will permit a return of the teaching of hydraulics and fluid mechanics to the Department.

Consideration might well be given to ways whereby the resources of other Departments of the Institute could be drawn upon. For example, the Department of Chemical Engineering might provide a general lecture course in industrial engineering for the graduate students in Sanitary Engineering. Such a course would be of real value to sanitary engineers who are likely to be faced with problems involving industrial wastes.

It seems to the Committee that the main objective of undergraduate courses in civil and sanitary engineering is educational. Research, essential as it is in the field of pure science and at the graduate level, should not be stressed unduly at the expense of thorough training of undergraduates in the fundamentals of science and technology.

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WILLIAM WILDER '98, 4 Dayton Place, Worcester

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ALLYNE C. LITCHFIELD '17, U. S. Rubber Company, 6600 East Jefferson Avenue, Detroit 32

MINNESOTA

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LOUIS A. METZ '23, Ceco Steel Products Co., 1141 North 11th Street, Omaha

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JOHN C. FRUIT '02, Equitable Life Insurance Society of U. S., 393 7th Avenue, New York 1

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C. KING CROFTON '22, 1192 Lincoln-Alliance Bank Building, Rochester

THERON C. JOHNSON '33, General Electric Company, 1 River Road, Schenectady 5

J. MURRAY HASTINGS '13, 606 Hills Building, Syracuse

OHIO

JAMES B. HOLDEN '30, 276 Sundale Road, Akron

KENNETH A. WRIGHT '19, Johnson Service Company, 1905 Dunlap Street, Cincinnati 14

CHARLES B. ROWLEY '12, Charles Bacon Rowley and Associates, Keith Building, Cleveland

JAMES H. BLODGETT '20, Superintendent, Division of Sewage Treatment, Columbus

EUGENE HERZOG '27, 26 Cliff Street, Dayton

CHARLTON P. WHITTIER '27, Owens-Illinois Glass Company, P. O. Box 1035, Toledo 1

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DANA M. WOOD '06, 619 Union Building, TVA, Knoxville

DONALD W. SOUTHGATE '11, Nashville Trust Building, Nashville 3

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JONATHAN A. NOYES '12, 4848 Northwest Highway, Dallas

JOE McEVoy, McGowan Avenue, Houston

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GEORGE M. GADSBY '09, Utah Power and Light, Kearns Building, Salt Lake City

VIRGINIA

JOHN STACK '28, N.A.C.A., Langley Field, Newport News

DONALD N. FRAZIER '11, 1226 Mutual Building, Richmond

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HOLLAND H. HOUSTON '24, 215 Fifth Street, Olympia (Seattle area)

HOMER C. BENDER '09, 921 East 19th Street, Spokane

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PHILIP N. CRISTAL '17, 720 East Wisconsin Avenue, Milwaukee 2

TECHNOLOGY MEN IN ACTION

THE ALUMNI FUND — ITS PROBLEMS AND GROWTH

Progress Report

AS THIS IS WRITTEN, the seventh annual Alumni Fund is in its second month. If the record to date is any criterion, and we believe it is, it promises to be a highly successful year. We have already advanced halfway toward our goal in amount. By May 15 some \$76,000 had been received from 4,275 Alumni. The average gift of \$17.80 compares with last year's final figure of \$16.50.

Of especial interest is the fact that an increasing number of gifts are being made in the form of bonds and stock certificates. As one Alumnus stated, "I made money by giving to M.I.T.," and he gave detailed figures to prove that his gift of \$72.50 had actually saved him more than \$46. No new idea to many, it may not have occurred to others.

It is far too early in the year to attempt predictions. However, a welcome number of "new" contributions have been received; that is, gifts from Alumni who had not contributed in previous years. Last month on this page the importance of "regular" contributors to the continued healthy growth of the Fund was stressed. These men, and there are a very great number who have given regularly since the start, are its backbone. Each year they are joined by an increasing number of previous noncontributors. Last year, for example, 13 per cent of the gifts received were from this group, some of course newly added to Alumni rolls from the recently graduated classes. If this trend continues, and if all who read this page again join with us, the Fund can this year achieve new and unexpected heights. The start has already been made.

TECHNOLOGY MEN IN ACTION

M.I.T. MEN AT WAR

Up to May 22 over 9,535 Institute Alumni, including 37 Admirals, 8 Commodores, and 95 Generals, were reported as being in the active naval or military services of the United Nations. Among the new promotions to be reported is Rear Adm. Leslie C. Stevens '22. There were 300 Alumni who had been decorated, and 183 who had made the supreme sacrifice.

With its issue dated November, 1942, The Technology Review began publishing "M.I.T. MEN AT WAR." Although hostilities have ended, The Review plans to continue this page for the next several months in order to record information on M.I.T. men in the services which, to date, has been impossible to obtain. As a matter of convenience, promotions and corrections in the rank previously given are grouped under a single heading, "Changes in Rank." The Review Editors are greatly indebted to the many Alumni and other readers who are continuing to co-operate so helpfully in reporting inevitable errors of omission and commission which they note in these listings.

DECORATIONS

- 1917 Hegenberger, Albert F., *Maj.*, U.S.A., Distinguished Service Medal—in connection with speedy evacuation of Allied prisoners of war and ferrying of Chinese troops in reoccupation missions of Chinese Government in addition to shifting great quantities of American equipment and personnel throughout China; Distinguished Flying Cross; Oak Leaf Cluster to Distinguished Flying Cross; Mackay Trophy Medal; Order of Crown of Italy; Order Cloud Banner (China)
- 1922 Freedman, Leo H., *Maj.*, U.S.A., Legion of Merit—as director of the mental hygiene division of the Medical Corps at Camp Plauche, La., he exhibited an unusually high degree of resourcefulness and creativeness which aided immeasurably in the accomplishment of military missions which are vital to the maintenance of the mental health of military personnel.
- 1925 Cuniff, James F., *Capt.*, U.S.N., Bronze Star—in connection with operations on Okinawa.
- 1931 Crotty, Francis C., *Lt. Col.*, U.S.A., Legion of Merit—through his foresight and administrative ability, sound employee relations were established, effective training programs developed, and practical personnel policies instituted: distinguished himself as chief, training division, and as director of industrial relations, Watertown Arsenal.
- 1933 Newton, Carroll T., *Col.*, U.S.A., Legion of Merit—for services with the Fifth Army; Oak Leaf Cluster to Legion of Merit; Croix de Guerre with Palm.
- 1937 Matthews, Norman A., *Lt. Col.*, U.S.A., Legion of Merit—for making valuable and far-reaching contributions in ferrous metallurgical research as chief, armor section, and director of the laboratory, Watertown Arsenal.
- 1940 Hollomon, John H., *Capt.*, U.S.A., Legion of Merit—his keen insight and great enthusiasm, combined with exceptional technical ability, contributed substantially in the search for superior materials for the manufacture of critical ordnance items such as armor guns and constructional steels; laboratory, Watertown Arsenal.

NEW LISTINGS

U.S.A.

- 1919 Cook, Andrew A., *Lt. Col.*
- 2-44 Tyree, Lewis, Jr., *1st Lt.*
- 6-45 Robeck, Arnold, *Pvt.*
- Sanchez-Nieva, Ferdinand, *Pvt.*
- 2-46 Brite, Leigh A., *Pfc.*
- Filardi, Anthony D., *Pvt.*
- Goodstein, Robert, *Pvt.*
- McCarthy, John F., *Pvt.*

U.S.N.

- 1942 Close, Robert R., *Lt.*
- 1943 Grauten, Henry S., *Ens.*
- 2-44 Coverdale, Miles, *A.E.T.M.Sc.*
- 6-45 Beam, William N., *Ens.*
- 2-46 Davis, James O., Jr., *Ens.*
- Finkel, Howard A., *Ens.*
- Kondolf, Mathias R., Jr., *Ens.*
- Kurriess, Francis N., *Ens.*
- Ray, James C., *Ens.*
- Rittenhouse, Earl G., *Ens.*
- Smith, Edwin R., *Ens.*
- Whitehill, William J., *Ens.*
- 10-46 Marks, Robert H., *Ens.*
- Wetmore, Kenneth R., *Ens.*

CHANGES IN RANK

U.S.A.

- 1912 Chandler, R. W., *Maj. to Col.*
- 1915 Tobey, James A., *Lt. Col. to Col.*
- 1916 Lewis, Chester F., *Maj. to Lt. Col.*
- 1920 Kahn, Harry J., *Capt. to Maj.*
- Wason, Alfred B., *Maj. to Lt. Col.*
- 1921 Card, Thomas B., *Lt. Col. to Col.*
- Moss, Lewis W., *Maj. to Lt. Col.*
- 1922 Roberson, William C., *Lt. Col. to Col.*
- 1923 Wilder, Philip S., *Maj. to Lt. Col.*
- 1925 Barron, Clarence B., *Lt. Col. to Col.*
- 1926 Rogers, Robert W., *Maj. to Lt. Col.*
- 1927 Connor, Robert T., *Maj. to Lt. Col.*
- Wheeler, Kimball L., *1st Lt. to Maj.*
- 1928 Johnson, John W., *Capt. to Maj.*
- Rouleau, John K., *Maj. to Lt. Col.*
- 1929 Moses, Laurence R., *Maj. to Lt. Col.*
- Slagle, Willard J., *Lt. Col. to Col.*
- 1930 Heifetz, Arthur, *Maj. to Lt. Col.*
- Huckle, Myron S., *Maj. to Lt. Col.*
- McManus, Thomas K., *Maj. to Lt. Col.*
- Small, Charles H., *Maj. to Lt. Col.*
- 1931 Arien, Samuel S., *Capt. to Maj.*
- Leadbetter, Robert T., *Capt. to Lt. Col.*
- Lutz, Francis A., *Maj. to Lt. Col.*
- 1932 Glowa, L. William, *Capt. to Maj.*
- Talcott, Agnew A., *1st Lt. to Capt.*
- 1934 Humphreys, Henry D., *Maj. to Lt. Col.*
- 1935 Bloomgarden, Barclay H., *Maj. to Lt. Col.*
- Tebbetts, John C., Jr., *Capt. to Lt. Col.*
- 1936 Johnson, Henry C., *Maj. to Lt. Col.*
- Souder, James J., *Maj. to Lt. Col.*
- 1937 Chase, Charles C., *Maj. to Lt. Col.*
- Kozak, Walter F., *Lt. to Capt.*
- Sherriff, Fred, *Lt. to Capt.*
- Smedile, Joseph A., *Lt. Col. to Col.*
- Walsh, James E., *Maj. to Col.*
- 1938 Green, Giles G., *Capt. to Maj.*
- Grosselinger, Frederick B., *Maj. to Lt. Col.*
- MacDonald, Donald S., *Lt. to Capt.*
- 1939 Dupree, George W., *A.C. to Capt.*
- Graffeo, Alphonse J., *Maj. to Lt. Col.*
- Hayes, Thomas J., *3d, Lt. Col. to Col.*

- Perkins, Lawrence, *Capt. to Maj.*
- Peskoe, Irving, *Lt. to Capt.*
- Reed, Harlow J., *1st Lt. to Capt.*
- 1940 Kilgore, Harold D., Jr., *2nd Lt. to 1st Lt.*
- Sharpe, Myer, *Pvt. to Lt.*
- 1941 McNally, David S., *Maj. to Lt. Col.*
- Nelson, Conrad N., *Lt. to Capt.*
- Totten, George C., Jr., *2nd Lt. to 1st Lt.*
- Young, Cecil G., Jr., *Lt. to Capt.*
- 1942 Mitchell, David B., *Lt. to Capt.*
- Norton, Donald A., *Capt. to Maj.*
- Rote, William A., *Capt. to Maj.*
- Seaton, William B., *1st Lt. to Capt.*
- 1943 Perry, Frederick G., Jr., *1st Lt. to Capt.*
- 2-44 Bettes, Richard S., *Pvt. to 1st Lt.*
- DeAgazio, Emil A., *2nd Lt. to 1st Lt.*
- Delano, Warren B., *2nd Lt. to 1st Lt.*
- Dershowitz, Arthur F., *T.5 to T.3.*
- Heckel, Alfred H., Jr., *Pvt. to Lt.*
- Knapp, Norman T., *2nd Lt. to 1st Lt.*
- 1944 Roos, Edwin G., *Cadet to 1st Lt.*
- Boreham, Howard B., *Pvt. to 1st Lt.*
- Bressler, Clarke S., Jr., *A.C. to W.O.*
- Buck, Thomas F., *Pfc. to 2nd Lt.*
- Hunter, John P., Jr., *Pfc. to Lt.*
- Nelson, Harold B., *2nd Lt. to 1st Lt.*
- 6-45 Agoston, Peter P., *Pvt. to Pfc.*
- de Vries, John A., *A.S. to 1st Lt.*
- Jansen, Hugh M., Jr., *Pvt. to 1st Lt.*
- Lacy, Thomas B., *Pvt. to S. Sgt.*
- Lott, Jeremiah A., *Corp. to T. Sgt.*
- Stoessel, Edward P., *Pvt. to 1st Lt.*

U.S.N.

- 1901 Bittinger, Charles, *Comdr. to Capt.*
- 1919 de Lima, Oscar A., *Lt. Comdr. to Comdr.*
- 1922 Eckberg, Adrian E., *Lt. Comdr. to Comdr.*
- Folinsbee, Harrison D., *Lt. Comdr. to Comdr.*
- Stevens, Leslie C., *Lt. Comdr. to Rear Adm.*
- 1924 McMahon, H. Easton, *Comdr. to Capt.*
- White, Harrison G., *Comdr. to Capt.*
- 1925 Cooper, Harry E., *Lt. Comdr. to Comdr.*
- 1926 Constantine, Basil G., *Lt. to Lt. Comdr.*
- Whiting, Richard, *Lt. Comdr. to Comdr.*
- 1928 Burnell, Homer A., Jr., *Lt. to Lt. Comdr.*
- Logan, Albert V., *Lt. to Lt. Comdr.*
- 1929 Dockweiler, Edward V., *Lt. Comdr. to Capt.*
- 1930 Brauer, Carl F., *Lt. to Lt. Comdr.*
- Cook, John W., Jr., *Lt. Comdr. to Comdr.*
- 1931 Allen, Philip, Jr., *Lt. Comdr. to Comdr.*
- Humphreys, George C., *Lt. Comdr. to Comdr.*
- 1932 Fritz, Edmund B., *Lt. to Lt. Comdr.*
- Tybuski, Leo T., *Lt. to Lt. Comdr.*

- 1933 Hungerford, E. Arthur, Jr., *Lt. to Lt. Comdr.*
- Ruble, Richard W., *Lt. Comdr. to Capt.*
- 1934 Dobbins, William E., *Ens. to Lt. (j.g.)*
- Miller, Henry C., Jr., *Lt. Comdr. to Comdr.*
- 1935 Englund, Harry W., *Comdr. to Capt.*
- 1937 Mank, Sidney, *Lt. to Lt. Comdr.*
- Wallin, Harry N., *Lt. Comdr. to Comdr.*
- 1938 Wagner, Alfred F., *Lt. to Lt. Comdr.*
- 1939 Cruciger, James R., *Ens. to Lt.*
- Hydeman, William R., *Lt. to Lt. Comdr.*
- Laubach, James H., Jr., *Lt. to Lt. Comdr.*
- McKeag, Malcolm F., *Ens. to Lt. (j.g.)*
- 1940 Barton, Alfred P., *Lt. to Lt. Comdr.*
- Foster, Walter M., *Lt. to Capt.*
- Pollak, Edward G., *Lt. to Lt. Comdr.*
- 1941 Dewey, Davis R., *2nd, Lt. (j.g.) to Lt. Comdr.*
- Magnusson, Philip C., *Lt. (j.g.) to Lt.*
- Neighbours, James W., *Lt. to Lt. Comdr.*
- Pohndorf, Henry L., *Ens. to Lt. (j.g.)*
- 1942 Goulder, Morton E., *Ens. to Lt.*
- 1943 Jones, Frank C., *Lt. Comdr. to Comdr.*
- Kelly, Albert J., Jr., *Ens. to Lt. (j.g.)*
- 2-44 Daggett, Maxcy D., Jr., *Ens. to Lt. (j.g.)*
- Dodge, Austin P., *Ens. to Lt. (j.g.)*
- Madwed, Albert, *Ens. to Lt. (j.g.)*
- Nelson, Kenneth W., *Ens. to Lt. (j.g.)*
- Schilling, Spencer A., *Ens. to Lt. (j.g.)*
- Smith, Robert B., *R.T.Sc. to E.T.M.Sc.*
- Whiffen, Richard E., *Ens. to Lt. (j.g.)*
- 10-44 Moore, Henry B., *Mid. to Ens.*
- 6-45 Baum, Richard V., *A.R.T.Sc. to A.E.T.M.Sc.*
- Collmus, Dwight, *A.S. to Ens.*
- Davis, Harry F., *A.R.T.Sc. to A.E.T.M.Sc.*
- Diethe, John L., Jr., *A.S. to Ens.*
- Knerr, Conrad H., *S.1c. to E.T.M.Sc.*
- Malloy, Edwin, Jr., *Lt. to Comdr.*
- Nebel, Walter R., *A.S. to H.A.1c.*
- Reid, John T., *S.1c. to A.R.T.Sc.*
- Rubin, Eugene S., *A.S. to Ens.*

U.S.M.C.

- 1927 Flag, James D., *Capt. to Maj.*
- Willcutt, Frederick W., *Capt. to Maj.*

CASUALTIES

- 1929 *Houck, William G., Jr., *Lt. (j.g.), U.S.N.*
- 1940 *Teich, Lawrence, *Lt., U.S.A.,—legally declared dead; missing since the fall of Corregidor on May 7, 1942.*
- 6-45 *Clement, Robert C., *2nd Lt., U.S.A.*

★ Killed in Action

† Missing in Action

‡ Prisoner of War

* Died or Killed in Service

** Wounded

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

American Physical Society

The 271st meeting of the Society, a joint meeting with its New England section, took place in Cambridge on April 25, 26, and 27. The Thursday and Saturday sessions were held at Harvard University; the Friday session, at Technology. On Thursday afternoon in Sanders Theater, the Society heard Lise Meitner of Stockholm, distinguished for her investigations into the process of fission, on an "Attempt to Single out Some Fission Processes of Uranium by Using the Differences in Their Energy Release." On Thursday evening a dinner at the Continental Hotel was followed by an address on "Microwave Radar" by L. A. du Bridge, director of the Radiation Laboratory. Saturday morning was reserved for papers on "The Interaction of Science and Society," by President Conant of Harvard, on his "Scientific Mission to Japan," by President Compton of Technology, and on "Fifty Years of Physics, a Study in Contrasts," by G. F. Hull, Sr., professor of physics at Dartmouth.

At the intervening sessions, the following papers were among those presented by Technology Alumni and Staff: "Reflection of Sound Signals in the Troposphere," by George W. Gilman '23, VI-A, with F. H. Willis; "Ultrasonic Absorption and Velocity Measurements in Liquids by Means of Pulse Techniques," by John R. Pellam '40, VIII, and John K. Galt '43, VIII; "Control and Recording Circuits for a Magnetic Beta-Ray Spectrograph," by Wendell C. Peacock '44, VIII, and Robert K. Osborne '42, VIII; "Beta- and Gamma-Ray Spectra of La^{40} ," by Robert K. Osborne '42, VIII, and Wendell C. Peacock '44, VIII; "Positron Emission, Electron Capture Competition in Zn^{65} ," by Wilfred M. Good '44, VIII, and Wendell C. Peacock '44, VIII; "Nuclear Excitation Functions: 14-Mev Deuteron Reactions on Cu, Mg, and Al," by Eric T. Clarke '44, VIII, and John W. Irvine, Jr., '39, V; "Noise in Radar Crystal Detectors," by Leonard I. Schiff '37, VIII; "High Frequency Rectification Efficiency of Radar Crystal Detectors," by Leonard I. Schiff '37, VIII, with A. W. Lawson and B. Goodman; "Magnetron Generators," by James B. Fiske '31, VIII; "Microwave Circuits," by Albert G. Hill, Associate Professor of Physics; "The Photoelectric Mechanism of the Thallous Sulfide Photo-Conductive Cell," by Arthur R. von Hippel, Associate Professor of Electrical Engineering, Frank G. Chesley '40, V, Phyllis B. Ulin '44, VI, and Edmund S. Rittner '39, V, with H. S. Denmark; "The Velocity of Propagation of the Transmitted Photo-Effect in Silicon Crystals," by Frederick C. Brown '26, VI; "Oscillographic Study of the Dielectric Properties of Barium Titanate," by Alexander de Bretteville, Jr., '42, VIII; "Preliminary Studies on the

Design of a Microwave Linear Accelerator," by John C. Slater, Professor of Physics, Edgar Everhart, and Robert A. Rapuano, research associates in physics, with J. Halpern; "Phase Stability of Synchrotron Orbits," by Nathaniel H. Frank '23, XIV; "Production of Mesons by Electrons," by Herman Feshbach '42, VIII; "Scattering and Absorption of High Voltage X-Rays in Steel," by John A. Hornbeck '46, VIII, and Herman Feshbach '42, VIII; "The Insulation of High Voltages in Vacuum," by John G. Trump '33, VI; "A Compact High Voltage Electrostatic Generator Using Sulphur Hexafluoride Insulation," by William W. Buechner '35, VIII, Robert J. Van de Graaff, Associate Professor of Physics, Anthony Sperduto '42, VIII, Ernest A. Burrill, Jr., '43, IX-A, L. R. McIntosh, and R. C. Urquhart, Division of Industrial Cooperation; "Preparation and Physical Properties of Sulfur Hexafluoride," by Walter C. Schumb, Professor of Chemistry; "A Method of Determining Focal Spot Size in High Voltage Radiography," by Anthony Sperduto '42, VIII; "The Absorption of 1-cm Electromagnetic Waves by Atmospheric Water Vapor," by Robert L. Kyhl, research associate in electrical engineering, with R. H. Dicke and Robert Beringer; "The Frequency Dependence of Radar Echoes from the Surface of the Sea," by Herbert Goldstein '43, VIII; "Fast Sweep Synchroscope," by David F. Winter, research associate in electrical engineering; "Minimal Noise Amplifiers," by Edward J. Schremp '34, VIII; "Equivalent Noise Representation of Multi-Grid Amplifier Tubes," by Edward J. Schremp '34, VIII, with R. Q. Twiss; "Complex Conductivity of Electrical Discharge in Gas at Microwave Frequencies," by Melvin A. Herlin, research associate in physics, and Sanborn C. Brown '45, VIII; "Characteristics of the Pre-Corona Discharge and Its Use as a Reference Potential in Voltage Stabilizers," by Sanborn C. Brown '45, VIII; "Pulse Amplifiers," by Henry Wallman, Assistant Professor of Mathematics; "The Amplification of Low Frequency Signals," by George E. Valley '35, VIII; "Low Pressure Gas Discharges in Microwave TR Tubes," by Louis D. Smullin '39, VI; "Design of Copper Disk Seal TR Tubes," by Arthur L. Samuel '25, VI-A, with J. W. Clark and A. E. Andersen; "Gas Discharge Switches for Controlling Low Power Microwave Signals," by Louis D. Smullin '39, VI, with T'ing-Sui Ke; "Recovery Time Measurements on TR Tubes," by Arthur L. Samuel '25, VI-A, with C. F. Crandell and J. W. Clark; "Cross Sections for Capture of Electrons from TR-tube Recovery Measurements," by Cortland S. Pearsall '39, XII, with C. G. Montgomery, F. L. McMillan, and I. H. Dearnley; "An Equivalent Circuit for the Microwave TR Tube," by Arthur L. Samuel '25, VI-A; "Microwave Duplexing Circuits," by Harold K. Farr '35, VIII; "Modulation and Tuning of Cavity Oscillators by Electron Beams,"

by David S. Saxon '41, VIII; "Energy Build-Up in Magnetrons," by Lloyd P. Hunter '39, VIII; and "Electron Orbits in the Synchrotron," by David S. Saxon '41, VIII.

American Chemical Society Luncheon

A large body of M.I.T. students and Alumni gathered in Atlantic City for the convention of the American Chemical Society, the first regular meeting to be held since meetings were curtailed by the war-time restrictions. The group had luncheon in the Cambridge Room of the Claridge Hotel on Tuesday, April 9. More than 100 Technology men and guests attended. The meeting was addressed by Bradley Dewey '09, who discussed future plans for the better organization of the American Chemical Society, and by Professor Arthur C. Cope, the new Head of the Department of Chemistry. In introducing Professor Cope, the chairman pointed out that the growing importance of chemistry makes it desirable for Technology to have the strongest possible department. Professor Cope was regarded by the chemists as a very valuable addition to a great department. There was an opportunity for a brief social meeting after the luncheon.

Technology Club of Chicago

As a climax to the Club's finest season, 219 members attending the meeting at the Sherman Hotel on April 8 had the unusual honor of meeting Dr. Karl T. Compton and a number of other distinguished guests: namely, R. G. Gustavson, Vice-president and Dean of the Faculties, University of Chicago; O. W. Eshbach, Dean of the Technological Institute at Northwestern University; Henry T. Heald, President of the Illinois Institute of Technology; and Arthur Cutts Willard, President of the University of Illinois. The personal hosts to our guests of honor were as follows: Robert E. Wilson '16, member of the Corporation, M.I.T., chairman of the board, Standard Oil Company (Indiana); James N. Barker '07, member of the Corporation, M.I.T., chairman of the board, Allstate Insurance Company; John M. Frank '07, President, Ilg Electric Ventilating Company; Harold B. Harvey '05, member of the Corporation, M.I.T., President, Harvey Metal Corporation; Louis H. G. Bouscaren '04, Vice-president, Stone and Webster Engineering Corporation; and Armand H. Peycke '11, Vice-president, American Steel Foundries. Also at the head table were: Sherry O'Brien '17, immediate Past President, Technology Club of Chicago, and assistant to the President, Harvey Metal Corporation; and Edmund G. Farland '21, President, Technology Club of Chicago, and Secretary and General Manager, United Conveyor Corporation.

In keeping with our custom, the evening began with a good old-fashioned get-

together before dinner in the clubroom adjoining the dining hall. A musical trio, talented for old favorites such as "Sweet Adeline" and "Down by the Old Mill Stream" was on hand. The trio's achievement was twofold in that it dutifully supported the good voices present and effectively camouflaged those which were not. Promptly at seven, members and guests sat down to dinner, and every chair was filled. John Frank, toastmaster, in his introduction, gave a concise narrative of characteristic and interesting achievements and crises in the life of Dr. Compton. At this point Rad Stevens '17 led in a regular M.I.T. cheer.

Dr. Compton, in his comfortable and informal manner, dealt with two subjects in his talk. The first consisted of the interesting meetings he had had with Japanese and Philippine graduates of the Institute while on his tour of inspection of Japanese imperial technological schools and laboratories in the Far East immediately after the capitulation of the Japanese to the Allies. On one occasion in particular, after spending the morning questioning a group of high-ranking officers in the Japanese navy, Dr. Compton remarked to the young Jap naval officer who had been acting as his interpreter that his English was unusually good. The surprising reply was simply, "I am sure, Sir, that you could hardly remember all the men in each of the M.I.T. graduating classes. I was graduated from Tech in 1937." Instances similar to this were not uncommon during Dr. Compton's visit.

The second half of Dr. Compton's talk dealt with financial and academic plans at the Institute and the problems involved: (1) Before the war, the Institute's operating budget ranged between four and four and one-half millions of dollars. For 1946 this figure will be doubled: five millions will be absorbed by the academic budget, while another four and one-half millions will be devoted to industrial or government-sponsored research projects. (2) With the facilities available before the war, the total Institute enrollment was approximately 3,200 students. This year, with only a few new buildings, it is planned to handle the flood of returning veterans seeking entrance, nearly 4,500 students. (3) Applications for admission, at this writing, are arriving in Cambridge at the rate of around 4,000 a week — meaning that only 1 per cent of the applicants can be accepted. In addition, both Army and Navy are exerting considerable pressure for acceptance of a large number of graduate students. (4) Living quarters are not available. Estimates have been made for the installation of sleeping and studying facilities in the Walker Memorial gym and the National Guard Armory, in an effort to put a roof over the heads of a portion of the students. (5) Some emergency housing for married students erected in the athletic field was the first college housing project in the country to be completed among those requiring the erection of new buildings. Furthermore, a new 300-student dormitory has been planned for construction on the west side of Massachusetts Avenue. (6) A number of new teaching and research facilities will include a new library building and equipment — to be the best of its kind in the country — a hydraulics labora-

tory, a much-needed gymnasium, and a nuclear physics laboratory. (7) Of the nine millions needed, but six and one-half are available.

Sherry O'Brien, as chairman of the committee on the Alumni Fund, spoke briefly on our goal of greatly increasing the number of donors to this fund and stated the simple but vital reasons for so doing. Credit for the success of this outstanding meeting should be given to Ed Farrand, President, and Don Gilman '32, chairman of the dinner committee, made up of Al Mulliken '32, Bob Deutsch '40, and Charlie Billman '25. — ELMER D. SZANTAY '35, *Secretary*, Sandee Manufacturing Company, 3945 North Western Avenue, Chicago 18, Ill.

M.I.T. Association of Cleveland

Some 200 Greater Cleveland and Akron Alumni were on hand at the University Club on April 10 to greet Dr. Compton on his first postwar visit. The usual round of refreshment, a delicious chicken dinner (the inflation rumor was well substantiated — address complaints to J. Kraus '41), and a medley of old-time barber shop favorites, by the General Electric Nela Park Lamp-lighters, preceded a very interesting and informative chat by Dr. Compton.

Dr. Compton began his talk with some interesting sidelights on his late-summer trip to the Pacific. He recounted meeting Technology men in many odd places, indulging in odd pursuits, and observed that their occupations, if not always appearing fully legitimate, were invariably resourceful. Nor were these chance meetings confined to areas without Japan, for even within the enemy country several graduates presented themselves. Dr. Compton spoke of the imaginative and quite tenuous death ray with which the Japanese military had tried to bolster sagging public morale. With a few remarks on the prime causes for Japanese defeat, in particular the lack of teamwork between the military and the industrialists, Dr. Compton passed to an enumeration of the hopes and prospects for the Institute. On a bright Technical horizon he revealed plans for a new library to house some three million volumes and planned to provide for the students' cultural, as well as scientific, background. A new dormitory is expected to ease the acute housing shortage. Other accommodations desired for the Institute include an addition to the automotive laboratory, with facilities for studies in jet propulsion, a new machine laboratory, and a hydraulics laboratory, complete with a towing tank. Finally, Dr. Compton revealed that new expansions would also provide laboratory facilities for advanced work both in the fundamentals of microwaves and in the nuclear sciences.

Most of the regular Cleveland crowd were on deck for this occasion, and it was certainly very heartening to see such a fine turnout from Akron. In closing, it may truthfully be said that, after hearing the second portion of Dr. Compton's message, the average Alumnus felt that he was born about 50 years too soon! — CHARLES H. SMITH, JR. '42, *Secretary*, Steel Improvement and Forge Company, 970 East 64 Street, Cleveland 14, Ohio.

Indiana Association of the M.I.T.

The 22 members of the Association who attended the April meeting ranged from W. M. Taylor '86 to two members of the Class of 1940. With their five guests, they enjoyed a fine turkey dinner served at the Indianapolis Athletic Club.

A. A. Potter '03, dean of engineering at Purdue University, gave a splendid talk on "Trends in Higher Education." He traced the growth of engineering schools in the United States. Many of the earlier schools were opened as a result of land grants given by the Federal Government to the respective states. At that time, the established colleges did not look with favor on this development. The result was that many engineering schools, such as M.I.T. and Purdue, were founded by the effort of individuals. At the present time, all recognized schools of advanced standing are very crowded because of the returning soldiers who wish to acquire or complete their education. The soldiers have seen how desirable it is to have a scientific education. Dean Potter stressed the fact that people in this country do not so much desire security, as opportunity. He emphasized the fact that cultural subjects and training in good citizenship should be included in every engineering course. We were all proud of Dean Potter as an M.I.T. man and felt that Purdue was fortunate in having him for its dean of engineering.

The following members were present: William M. Taylor '86, J. Lloyd Wayne, 3d, '96, Joseph W. Stickney '96, Andrey A. Potter '03, John L. Bray '12, George P. Allen '16, John H. Babbitt '17, Edwin M. McNally '18, Lowell L. Holmes '23, Batist R. Hauelsen '23, Harry C. Karcher '25, Robert C. Wallace '27, Thomas G. Harvey '28, Gustav W. Klumpp '30, John J. Demo '35, Constant L. Bouchard '36, Frank O. Nottingham, Jr., '37, John D. Baker '38, Samuel H. Hopper '33, Gordon E. Holbrook '39, Gerald J. McCaul '40, and John R. Diver '40. — JOHN H. BABBITT '17, *Secretary*, 3734 Carrollton Avenue, Indianapolis 5, Ind.

Technology Club of Southern California

The Club is sponsoring a directory of all Alumni living in southern California. It is to be published for the purpose of increasing friendships among Alumni and presenting a means whereby they may more readily get in touch with one another for social and professional relations. The directory will be self-supported through paid advertisements, professional cards, and voluntary contributions from Alumni and for quick reference will be broken down into three sections: (1) Name, (2) Class and Course, (3) Industry or profession. It will be distributed to about 1,000 M.I.T. Alumni living in southern California. Having a useful life of a year or more, it offers attractive advertising possibilities. Anyone interested in space for advertising or professional cards should correspond with Ford W. Sammis '28, 1560 Wilson Avenue, San Marino, Calif. Professional cards are \$5.00 each and are restricted to M.I.T. Alumni. Since the volume of advertising is purposely limited, application

should be made immediately. The members of the directory committee are as follows: G. M. Cunningham '27, chairman; H. E. Beebe '10, K. D. Kahn '15, F. W. Sammis '28, I. E. Hattis '34, R. L. Alder '37, and D. D. Weir '38. — D. DONALD WEIR '38, *Secretary*, 1492 North Doheny Drive, Hollywood 46, Calif.

Technology Club of the Philippines

Since the last report of the group's activities, the Club has had three sizable gatherings, each varying in mood and purpose. On January 22, Mr. and Mrs. Ramon S. Sevilla '39 held a Washington's Birthday party in honor of the first year of Philippine liberation. All former students of M.I.T. were invited. Mr. Sevilla, a graduate of the Institute, said of the gathering in his home: "This is my way of expressing my greetings to my fellow M.I.T. friends from both near and far." A very delicious dinner was followed by an evening of dancing and good fellowship.

On Sunday, March 10, the second meeting of the month was devoted to a plant visit on board the power barge *Impedance*. Through the efforts of A. K. Ingraham, C. E., Officer-in-charge, M.I.T. men were given a complete picture of the power barge and its relation to the Manila power supply. The *Impedance* is one of a number of self-contained, floating power plants developed by the Army and towed across the ocean for operation as a central power station for coastal installations. Captain Ingraham devoted part of his time to a lecture on the history, development, and operation of the power barge and followed his talk by a conducted tour of the plant. The *Impedance* is a 50,000 horse-power steam power barge containing two General Electric generators, rated at 13,800 volts and carrying a normal power load of 30,000 kilowatts.

The third meeting of the period was held on Wednesday evening, March 20, at the Sigma Chi House in downtown Manila. The speaker was José S. Reyes, Secretary of State for the Philippine Commonwealth; his subject, "Relief, Rehabilitation, and Reconstruction." Dr. Reyes spoke with authority and displayed an amazing intimacy with the intricate details of American-Philippine commerce, statecraft, and opinion. On the subject of relief, Dr. Reyes particularly noted the importance of getting rice to the people of the northern provinces as quickly as possible before the rainy period sets in, in order to prevent mass starvation. The Philippines require, at this time, sizable imports of rice, flour, and textiles; and although most of these goods will be supplied by shipments from the United States, every effort is being made to import also from the near-by countries of Saigon, Indo-China, and Australia. In addition, building materials with which to rebuild the public structures damaged or destroyed by Japanese treachery are urgently needed.

Dr. Reyes spoke of the importance, in view of the forthcoming independence of the Philippines, of setting up trade relations with other nations. It is his hope that with the development of this independent trade, the Philippines may soon be able to stand alone among the nations of the world.

But in view of the damages caused by the war to the Philippine economy, he feels that a great amount of aid will be needed from the United States. "It is the hope of the Philippine Government," said Dr. Reyes, "that American and Philippine interests will join in partnership, for the purpose of rebuilding the Philippines quickly and profitably." Dr. Reyes held the attention of all present and was most generous in answering the spontaneous burst of questions following his formal talk.

The following Alumni have attended meetings during the February-March period: B. P. Abrera '32, E. A. de Agazio '44, A. P. Ames '19, E. P. Angeles '32, Marciano Angeles '28, W. H. Bertolet '45, W. J. Bright, 3d, '43, B. P. Bromfield '44, T. F. Buck '45, C. H. Concio '40, F. B. Connelly '46, A. A. Cook '19, C. I. Coronel '30, W. B. Delano '44, A. K. Deming '35, J. L. Dietche '45, M. H. Dixon '30, J. C. Espinosa '22, R. S. Faurot '44, W. W. Fisk '46, L. Z. Fletcher '43, J. M. Gassaway '45, M. J. Goodfriend '43, L. C. Hamlin '29, H. E. Harris '44, K. A. Ignacio '43, J. D. Ingham '43, P. I. de Jesus '30, A. C. Kayanan '42, J. T. Kelton '32, N. T. Knapp '44, K. A. Lambert, Jr., '45, E. F. Lawrence '41, R. E. Lawton '45, H. S. Lockwood '44, F. D. Mabbett '43, M. T. Manosa '21, George Oetinger, Jr., '25, D. J. Parr '45, H. G. Pastoriza '43, J. C. Perlas '40, H. L. Pohndorf '21, S. M. Porosky '43, F. D. Santana '32, K. G. Scheid '45, R. S. Sevilla '39, F. S. Smith '43, N. A. Teixeira '44, B. C. Turner '28, R. M. Vail '44, J. T. Villanueva '26, H. S. Walker '02, F. M. Yenke '29, G. Y. Zara '26. — STANLEY M. POROSKY '43, *Secretary*, Headquarters, Army Forces, Western Pacific, Office of the Chief Signal Officer, Signal Supply Division, A.P.O. 707, in care of Postmaster, San Francisco, Calif.

New Haven County Technology Club

Thirty members met for a 7:00 P.M. turkey dinner and evening of movies at the Hotel Duncan, New Haven, on Thursday, April 11. Before individual identifications, President Buck called upon George B. Southworth to take a bow as the member of the youngest class represented — 1898. C. E. Smith '00, placement committee chairman, reported several requests for Tech men as employees but few requests for employment assistance, a situation which appears to be typical of nationwide Technology placement activities. Roy Parsell '14 reported the early engagement of the Pine Orchard Club facilities for the annual meeting on June 8. A later announcement from Cambridge indicated a conflict with Class Day, but the group approved June 8 provided an alternate date cannot be arranged. Herb Polleys '18 announced that the Hartford club had been invited and that hard-working, enthusiastic committees were planning for at least 150 wives and members, a tentative estimate of attendance obtained from Walter Weeks' telephone squad.

Several railroad stories by W. W. Young '29 and C. E. Smith opened the festivities. You must attend if you want to hear these. Three excellent films were shown. A Westinghouse film, entitled "The

Dawn of Better Living," was furnished by Floyd Buck '29; the "Inside Story of Railroads," along with the projector and projectionist, by courtesy of C. E. Smith; and the story of "Corning Glass," through the efforts of Walter Weeks '24. A pleasant evening ended about 10:00 P.M. Those present included H. F. Bariffi '31, F. W. Buck '29, W. E. Case '37, Sid Eliot '27, L. B. Grew '27, R. S. Harper '40, P. H. Hatch '21, B. R. Hubbard '25, Samuel Jacobson '31, M. A. Jenckes '26, A. P. Libbey '26, W. P. Libbey, Jr., '32, F. S. Lutz '27, C. A. Lytle '37, H. H. Mardoian '19, T. C. Meriman '09, F. P. Nettleton '30, R. L. Parsell '14, A. M. Plant '31, H. R. Polleys '18, A. S. Redway '23, C. E. Smith '00, C. W. Somers '12, G. B. Southworth '98, A. H. Wagner '31, W. R. Weeks '24, M. S. Wellington '16, D. F. Willey '20, W. S. Wojtczak '37, and W. W. Young '29.

President Buck later appointed, as the 1946 nominating committee, Marshall Wellington, chairman, A. I. Blank '37, and A. M. Plant. Committees for the June 8th annual meeting and outing were announced in part, as of April 22, to be as follows: program — Herb Polleys, chairman, W. W. Young, A. I. Blank, Harold Manning '12, Stuart Boyd '18, and A. M. Plant; transportation — A. M. Plant; rainy weather — W. W. Young, L. B. Grew; registration — Mr. and Mrs. L. B. Grew, Mr. and Mrs. J. M. Rogers '40; club — Roy Parsell; cocktail hour — Mrs. Polleys, Mrs. Parsell, and Mrs. Buck; telephone — W. R. Weeks; favors — W. W. Young, Al Redway, and A. I. Blank. The Hartford club announced Franklin Atwater '38 as chairman of their joint arrangements committee. Nominal costs were forecast. — LAWRENCE B. GREW '27, *Secretary*, Southern New England Telephone Company, New Haven, Conn.

Technology Club of New York

This month, your correspondent is very much elated over being privileged to speak first of some of his classmates. The Class of 1924, a runner-up to 1922 in both quantity and quality, held a luncheon at the Club on April 25 to discuss plans for the June reunion. By the time you read this, I fear, the results will be fact, not fiction. But it was good to see and hear each of the following '24 men broadcast their achievements and desires, to wit: Bill Keplinger, W. J. Gress, George Arapakis, Nat Schooler, Anatole Gruehr, Greg Shea, Pret Littlefield, and Ed Jagger. And just to set a mark for the other classes to shoot at, we are having a dinner at the Club on the night of May 14 and another luncheon on May 27. Bill Robinson '24, Class President, is coming in from Cleveland to make some weighty decisions for the lamp department of General Electric, and we are using him as our ringmaster on the 14th. More on this occasion later. As for the luncheon described above, let it be said that after the second exercise in elbow bending, Greg Shea wrote out his check for a full year's membership in the Club.

The Class of 1909 had a gathering at the clubhouse on May 11, and the Class of 1927 held a dinner party on April 30. Yours truly planned to attend the latter, to do a little G-2 work for this sheet of Lobbie's in its next issue. Again, let me urge the

classes to utilize this privilege more than they are doing. It offers the most economical means I can think of for stimulating interest in local activity. And — not to overlook the opportunity for a commercial — it will help strengthen the Club at large. Some day, those of you who are interested will get the reason behind this plea on my part.

From all I can hear on the curbstone, Dr. Compton delivered the goods again on the 25th at the meeting of the American Newspaper Publishers Association at the Waldorf. As evidence of the company he was keeping, General Dwight Eisenhower was one of his two companion speakers. Your correspondent tried to horn in but, as a member of the Business Publishers League, couldn't make the grade without unjustified effort.

Sam Reynolds '22 and his membership committee have been doing a fair amount of plugging, and we have the following new members to report for last month: Kenneth W. Winsor '37, Roger G. Blum '41, Davis H. Tuck '11, Frank H. Simon '31, Gustave E. Kidde '33, William E. R. Covell '23, John M. Embree '45, Randolph A. Peers '37, Hugh G. Hamilton '29, Thomas R. Weymouth '97, William H. Warren '14, and Arsene W. Morin '31. I am sorry to report that conditions impelled S. E. Bradford '21 to submit his resignation. We hope he will find it possible to join us again some day.

Since the weather began to get so nice during the last month, the quantity of visiting firemen has fallen off somewhat. Those who had to come to the city in spite of the above were as follows: E. V. Piel '38, R. H. Bolt, staff, W. H. Callahan '26, Lachlan Mackenzie '22, W. E. R. Covell '23, W. H. James '40, J. K. Pickard '41, and K. W. Winsor '37. One of the most heartening deductions, at least to me, is that the younger graduates are beginning to return and percolate amongst us. We need new blood and welcome all who will honor us with a call.

A few brief personal items may well be mentioned. Most of you know by now that our Club President, C. George Dandrow '22, is campaigning for the vice-presidency of the Alumni Association. While he's unquestionably the worst executive golfer we possess, give the little fellow a hand and vote for him. Without the additional revenue, he may have to have us reserve him an apple corner at Madison Avenue and 40th Street. — Lee A. Swem, another of that hopeless '22 gang, is down at 165 Broadway, as assistant to the president of Foster-Wheeler Corporation. — We ran into Latimer F. Hickernell '22 the other day and learned that he is chief engineer of the American Brass Company. — A very pleasant evening was spent with Ex-Professor John H. Zimmerman '23 of the Linde oxygen division of Carbide and Carbon, where I also renewed acquaintance with my long-time friend, Harry Rockefeller '22. And while speaking of that relatively unknown Class of '22, Larry Davis, one of its shining exponents, is now managing the white products division of Socony-Vacuum Oil Company at 26 Broadway. We just missed seeing Dale Spoor '22 at "Professor" Zimmerman's.

About the time this appears in print, or shortly before, depending upon the speed

of Lobbie's editorial make-up department, the Club will be holding its spring outing at Lawrence Farms, Mount Kisco, N.Y. Bill Mueser '22 will be our host, but just try to get by the exit door without being spotted by Bill. It's a fine golf course, and we shall have plenty of privacy. Whether you carry the clubs, play golf, or not, I can assure you of an evening full of fun and not too expensive. Detailed instructions will soon be mailed; meanwhile, save the date. This about ends the season for your simple correspondent, and I hope you will be privileged to enjoy more inspiring transcripts in the years to come. But don't forget that the Club at 24 East 39th Street runs 12 months of the year, day and night. — WILLIAM W. QUARLES '24, Secretary, McGraw-Hill Publishing Company, 330 West 42d Street, New York 18, N.Y.

M.I.T. Club of Northern New Jersey

The Club now has a Constitution, and by-laws as well, and some day soon there may be some little documents defining the duties of all the officers. At the March meeting copies of a draft for a constitution drawn up by the officers during the previous two months were distributed to the active members, voted on, and adopted. Those who signed, some of them charter members of the present organization, were as follows: G. M. Warner '91, H. C. Colson, Jr., '09, J. P. Maxfield '10, A. I. Phillips, Jr., '10, E. M. Young '11, N. A. Hall '12, B. T. Rauber '14, R. A. Howe '15, Kebe Toabe '15, H. L. Bickford '16, A. R. Brooks '17, J. F. Maguire '17, A. C. Walker '18, F. J. Given '19, G. F. Des Marais '20, W. W. Brown '21, G. A. Chutter '21, C. A. Clarke '21, Sumner Hayward '21, F. E. Kowarsky '21, Joseph Wenick '21, W. J. Grady '22, C. D. Grover '22, H. D. MacDonald '22, A. P. Munning '22, H. L. Hayden '22, W. S. LaLonde, Jr., '23, C. E. Roche '23, S. H. Brown, Jr., '24, I. J. Korn '24, R. W. Hakeswessell '25, D. H. Spitzli '27, R. P. Westerhoff '27, L. B. Woolfenden '27, H. N. LaCroix '28, W. H. Phillips '28, E. H. Gilman '29, F. O. Pierson '29, V. J. Duplin, Jr., '31, A. E. Kocher '31, T. E. Graves '34, M. S. Neill '34, W. L. Wise, Jr., '34, C. E. Mann '35, B. S. Morgan '35, G. C. Putnam '36, L. P. Reitz, Jr., '37, A. L. Herman '39, J. R. Perkins, Jr., '39, R. S. Hess '40, G. W. Carnrick, Jr., '40, W. P. Burton '41, R. B. Delano, Jr., '41, A. A. Margolin '42, R. C. Hess '44.

At the March meeting, also, a nominating committee consisting of G. A. Chutter '21, chairman, A. R. Brooks '17, G. M. Warner '91, C. E. Roche '23, Kebe Toabe '15, and H. D. MacDonald '22, proposed the following slate of new officers, thereupon elected. President: Walter L. Wise, Jr., '34, 68 Brook Avenue, North Plainfield, N.J., Plainfield 6-2254-W; Vice-president: Frank O. Pierson '29, 15 Wyndehurst Drive, Madison, N.J., Madison 6-1356-M; Secretary: J. R. Perkins, Jr., '39, 21 Brainerd Street, Upper Montclair, N.J., Montclair 2-6957; Treasurer: V. J. Duplin, Jr., '31, 300 North Avenue, Fanwood, N.J., Fanwood 2-7708-W; Board of Governors: (for three years) G. M. Warner '91, Great Notch, N.J., Great Notch 4-0454; H. F. Ballard '09, 401 North Walnut Street, East

Orange, Orange 3-8859; C. E. Roche '23, Merck and Company, Rahway, N.J.; (for two years) Gordon Holbrook '10, 9 Beach Street, Maplewood, N.J., South Orange 2-3241; C. D. Grover '22, 12 Glen Oaks Avenue, Summit, N.J.; Kebe Toabe '15, 408 Winthrop Place, Elizabeth 3, N.J., Elizabeth 3-8467; (for one year) H. D. MacDonald '22, 95 Renner Avenue, Newark, N.J.; W. A. Johns '37, 34 Mali Drive, North Plainfield, N.J.; H. H. Brackett '12, 515 Summit Avenue, Oradell, N.J., New Jersey Bell Telephone, Newark; A. R. Brooks '17, Wayside, Short Hills, Summit Post Office, N.J.; W. L. Wise '34, 68 Brook Avenue, North Plainfield, N.J.

Our March meeting was quite well attended, with approximately 140 dinners served and a number of other men who came in for the talk following the dinner. We were especially pleased to have George Dandrow '22, President, and a party from the Technology Club of New York visiting with us. We were also pleased to welcome to the territory six new members who were coming in as active members.

Frank Pierson '29, Secretary, had to ride his pet hobby horse into the public eye and tell again the plans for our Directory or Bluebook of good Technology Alumni in northern New Jersey. This little booklet will be issued to all such early in the coming fall and will carry the names, addresses (home and business), and telephones of the active membership of the present year. This should prove to be a handy little item for business and social use. Frank has already sent out cards for collecting this information, has a partial return, and is impatiently awaiting the remainder.

George Chutter '21, in charge of placement for this area, reported on talking with a large number of veterans and felt that most of them were getting settled in jobs which should be satisfactory. We should like to call the attention of any men in this region to the fact that George is eager to help them in any way he can. You may get in touch with him at 109 Central Avenue, Glen Rock, N.J. (telephone: Ridgewood 6-1799-M); or at 90 West Broadway, New York City (telephone: Rector 2-4078).

Frank Maguire '17, of the scholarship committee, reported that the major activity was still with veterans rather than with civilians going to Tech and that it was mostly under the G.I. Bill of Rights. Things are not expected to be normal for some time.

Our March meeting was open to the wives and sweethearts. It was supposed to show them that the Club meetings were decorous, informative, socially uplifting, refreshing, and entertaining. If our attendance drops off at the coming meeting, it will prove to have been a sad mistake to allow the ladies within the sacred precincts of the Club. We await with bated breath. Seriously, they appeared to be impressed and to have a good time.

Following our rib roast (special by the Essex House chef) we were entertained aurally and visually by an excellent speaker. The *picco de resistance* was color photography, and the presentation was by John A. Tiedeman, head of the education department of the Ansco Corporation. It was quite obvious that color photography was

not only his job but also his hobby in his off hours. Dr. Tiedeman is an ex-college professor, having taught at Annapolis during the war and at various other colleges before that. He received his doctorate from the University of Virginia. The talk was well illustrated. There was a series of very carefully prepared and highly informative slides, showing the main features of additive and subtractive color film operation with explanations (for which we must forgive him — after all he gets paid by Anso) as to why the Anso process is the best of all. The technical discussion was followed by slides and movies, both professional and amateur. The latter items served as a contrast to the professional results and gave evidence of how easy it is to use the film and to process it after exposure. My guess would be that the speaker won more than enough converts to cover the expenses of the trip.

By the time this gets into print we should have heard a dilly of a talk on radar by Ivan Getting '33. But you never know what might happen; so I can't say we have heard it. I can't even tell you how many people will be there. We don't know. We've promised he will say a special word about the practicability of using radar in duckhunting, but he won't give us any advance information as yet. We can't even repeat any of his jokes.

Nor does this end our season's activities since there will be a picnic and shindig on the 25th of May. What with golf and beer and other refreshment in the morning, and beer and clams and beer and softball and beer in the afternoon (and beer), a good time should be had by all. Door prizes are to be awarded (who ever heard of a door at a picnic?), or at any rate the fellows winning at golf and softball will win some kind of a prize — even if it is just the privilege of buying a round of drinks for the rest of the gang. So plan to be with us on May 25th and have the swellest time. Wally Wise '34, Vic Duplin '31, Mac MacDonald '22, and the others have been working like all get-out trying to have everything ready for smooth sailing on that day. — FRANK O. PIERSON '29, *Secretary*, 15 Wyndehurst Drive, Madison, N.J. JOSEPH R. PERKINS, JR., '39, *Review Secretary*, 21 Brainard Street, Upper Montclair, N.J.

Technology Club of Philadelphia

In tribute to his 25 years of service as headmaster of the Episcopal Academy, Greville Haslam '15 was given a testimonial dinner on Thursday evening, April 4, at the school, City Line and Berwick Road, Overbrook, by the alumni, their parents and friends. Well-known in academic circles here and elsewhere in the United States, Dr. Haslam came to Episcopal as headmaster in 1921, when the academy moved from its old Locust Street site.

For information about Alumni in the Philadelphia area, call JEFFERSON 0642 — ROBERT M. HARBECK '28, *Secretary*, Fidelity Machine Company, Inc., 3908 Frankford Avenue, Philadelphia 24, Pa. *Assistant Secretaries*: SAMUEL K. McCauley '41, 288 Copley Road, Upper Darby, Pa.; FRANK S. CHAPLIN '32, 822 Glendalough Road, Philadelphia 18, Pa.

Technology Club of St. Louis

The Club was very fortunate in having Dr. Karl T. Compton at the April meeting. On Friday evening, April 5, Delos G. Haynes '09 and his charming wife were host and hostess to the Alumni and their wives. Dr. Compton, the guest of honor, gave those present, about 100, an informal but most exceedingly interesting account of his trip to Japan. He described the Japanese scientists and their progress on scientific equipment. The talk was followed by refreshments.

On the following afternoon, Joseph Desloge '12 entertained the Alumni and their wives at his home, "Vouziers," in Florissant, Mo., overlooking the Missouri River. Mrs. Arthur Compton, wife of Dr. Arthur Compton, chancellor of Washington University in St. Louis, accompanied Dr. Karl Compton. Mrs. Karl Compton's inability to be present in St. Louis was a disappointment to the Alumni. Vouziers was thoroughly enjoyed by everyone present.

The officers of the Club for 1946 are as follows: Paul H. Buxton '16, President; Wesley W. Wedemeyer '30, Vice-president; Laurence P. Russe '41, Secretary-Treasurer; and Edward A. Fulton '30, Joseph R. Mares '24, Irvin R. Mitchell '30, Elwood M. Proctor '24, Robert B. Semple '32, Eugene S. Weil '21, and David Q. Wells '30, governors. — LAURENCE P. RUSSE '41, *Secretary*, 5247 Westminster Place, St. Louis 8, Mo.

Technology Club of the Connecticut Valley

The Club convened at the Highland Hotel in Springfield on Friday, April 12, for dinner and the first meeting held by the Club for three years; 61 members and friends attended. Otto Kohler '27, President, served as master of ceremonies and presided over the head table, at which sat Norman Vile '16, President of the Hartford club; Louis Proulx '36, Secretary of the Hartford club; Daniel Brunton, mayor of Springfield; Professor Charles Locke '96, Alumni Secretary; Francis Schmitt, Professor and Head of the M.I.T. Department of Biology; Minot Edwards '22, Secretary, and Theodore Kresser '34, Treasurer of the Club. The meeting, addressed by Professor Schmitt, made the headlines in both Springfield papers, and the illustrated talk by Professor Schmitt on the subject of the electron microscope was of much interest to all members and guests.

We have nearly 400 Alumni in the Springfield, Northampton, and Holyoke areas on our mailing lists and, although all will receive notices of coming meetings, the Secretary wishes to take this opportunity, through *The Review*, to urge their united co-operation and interest in future activities. We are planning a picnic, to which the ladies are invited, for late June or early July.

The following attended the April dinner meeting: Henry D. Addison '31, Ralph H. Alden '24, Lewis B. Breed '96, Bernard Canter '30, Ames Carter '87, B. G. Constantine '26, R. E. Curtis '15, H. H. Dakin '99, W. F. Dewey '20, M. R. Edwards '22, W. A. Emery '21, W. K. Fitch '36, Alfred Furtek '41, S. E. Glick '41, A. F. Gould '38, W. J. Harris '30, H. W. Hill '07, Constance

Fuller Howes '14, P. S. Howes '14, H. R. Hopkirk '40, W. F. Kaufman '38, A. D. King '32, O. C. Kohler '31, T. O. J. Kresser '24, F. J. Lange '09, Marion Lincoln Lee '96, C. E. Locke '96, A. M. Lovenberg '16, V. P. Mango '31, L. O. Mills '11, A. Q. Mowatt '35, D. F. Mowery, Jr., '41, J. L. Newbegin '34, F. A. Nicoli '34, O. C. Norris '16, G. C. Pratt '33, L. J. Proulx, Jr., '36, C. W. Rieser '13, H. M. Riga '15, H. B. Robb '33, W. F. Roper '03, D. L. Ross '27, J. E. Roy '18, F. O. Schmitt, staff, L. A. Stone '35, J. R. Thompson '42, B. B. Tremere, Jr., '13, J. L. van Horne '34, N. J. Vile '16, R. W. Vose '31, Alfred Ziegler '31.

At an executive committee meeting held on Wednesday, April 24, Albert D. King '32 was appointed chairman of a committee on employment and placement; office address: DeBell and Richardson, 3 Post Office Alley, Springfield, Mass.; home address: 64 Harrison Avenue, Northampton, Mass. — MINOT R. EDWARDS '22, *Acting Secretary*, Holyoke Heater Corporation, 54 Waltham Street, Springfield 9, Mass.

CLASS NOTES

1883

Harvey Stuart Chase, certified public accountant and Secretary of the Class for 62 years, died on April 9, at Holiday House, Orlando, Fla., after several months' illness. He was 84 years old. Coming to M.I.T. from the family home in Haverhill, Mass., he was graduated with the Class from the Course in Mechanical Engineering. About three years later he married Nettie F. Rowe of Haverhill.

After several years of varied experience in engineering and business, he adopted the profession which his late father had practiced, of auditor and expert accountant. In 1897 he was the head of the firm of Harvey S. Chase and Company, certified public accountants, at 84 State Street, Boston. He specialized in devising uniform systems of financial accounting and reporting for municipalities, states, and public service corporations, which he applied in many cities and states in New England and outside, including such cities as Baltimore, Chicago, and Minneapolis and the states of Colorado, Maryland, New York, and Ohio. Probably his most important jobs were for the United States Government, as a member of President Taft's commission on economy and efficiency in 1911 and 1912; and as consultant to the Treasury in 1913 and for the Liberty Loan accounts during World War I.

During this busy period he was still our active class secretary, organizer, and enthusiastic participant in '83's class reunions. Those classmates who are still living will remember with pleasure one of the early reunions, when Mr. and Mrs. Chase entertained the Class at their West Newton home. Throughout his life Harvey was a great lover of the outdoors, an expert in such sports as golf and bowling on the green, and a tireless mountain climber.

In 1925 he retired from active participation in the business of his Boston firm, and he and Mrs. Chase began living in St.

Petersburg (and later, Winter Park), Fla., in winter, returning in summer to a country place in Lexington or Hamilton, Mass. About six years ago their house at 431 Chase Avenue, Winter Park, became their permanent year-round home. Here Harvey took an active interest in the affairs of the city and of Rollins College, where he gave a course of lectures on economic subjects. He was the author of several books on public economy, including, *The Budget of the United States on its Expenditure Side*.

The death of Mrs. Chase in 1943 was a severe blow to Harvey, who followed her in less than three years. He leaves a brother, Arthur T. Chase, living at Island Creek, Mass., a son, Stuart Chase, of Georgetown, Conn., and a daughter, Adelaide, now Mrs. Hiram T. Folsom, of Winter Park and Hamilton. — HORACE B. GALE, *President*, 10 Highland Street, Natick, Mass.

1887

Your Secretary, having been laid up for nearly 10 weeks but being now on the mend (he hopes),* will once again attempt to enlighten the members of the Class and the waiting world on some of the recent happenings. The Rev. John H. Keep, S.M.A., has changed his address from Willsboro, to East Moriches, Long Island, N.Y.

The death of Franz H. Schwarz on March 17 has been reported, with an obituary from the *Lawrence Sunday Sun*, appended here: "Franz H. Schwarz died . . . at his home, 165 Ferry St., following a long illness. He was born in Boston June 17, 1865, and attended Boston English high school. The late Mr. Schwarz graduated from M.I.T. as a mechanical engineer and following his graduation, he came to Lawrence and accepted a position at the Lower Pacific mills, worsted division. Upon his retirement in 1927 he was plant superintendent. Mr. Schwarz was a life member of the American Society of Mechanical Engineers and was a life member of the M.I.T. Alumni Association. He was also deacon and former superintendent of the Sunday school at the Trinity Congregational church. Surviving are his wife, Susan E. (Robinson) Schwarz; one son Edward R., a professor of textile technology at M.I.T.; three grandchildren, one sister, one nephew and two nieces. . . ."

A number of other news items are on file, and I hope to have sufficient strength to release them next month. — NATHANIEL T. VERY, *Secretary*, Salem, Mass.

* Mr. Very died on May 9. — Ed.

1888

As you know from Sanford Thompson's invitation of April 8, he has continued the "pinch-hitting" for Ned Webster, following Ivar Sjöström and Fred Ellis, by inviting the Class to the Engineers Club in Boston for our 58th annual class dinner, all details of which will appear in the November issue of *The Review*. At least 14 men are expected. Your Secretary hopes to be there, stopping off on his annual tour from Princeton to Chebeague Island, to greet all his classmates, whom he has not seen for the last seven years.

John Faxon, our class poet laureate, has sent the Secretary two communications covering all Technology men in Fitchburg, Mass., including the famous Dillon family, the youngest son of which gave Princeton

University its new four-million-dollar library, now under construction. — Fred Ellis is enjoying the facilities of the Hotel Statler, according to his latest communication. — Early in April, Sanford Thompson returned from his sojourn in Florida, where he divided his time between Pompano on the east coast and Sarasota on the west, driving across the Everglades.

Sumner B. Merrick died on December 31 at his home in Hanover, Mass. For some time after leaving Technology, Merrick followed in the footsteps of his father, teaching in manual training schools. Later he represented the Harrison Safety Boiler Works of Philadelphia. After this he was engaged in this country and Europe with a St. Louis company in the sale of oil well supplies. He was also interested in the development of oil wells in British Honduras. Sumner was very active in various kinds of business.

A letter from Lonsdale Green '87 encloses the copy given him of a letter from Ed Farrand '21, President of the Technology Club of Chicago, to Professor Locke '96, containing news for the Secretary of '88. Green at once acted on the news and forwarded the Secretary both cause and result of his action. Farrand's letter contained the brief information, gleaned from Herbert Kochs '25 (by chance a passenger in the same taxi with Nichols, though previously unacquainted with him), that Fred R. Nichols had entered the Illinois Masonic Hospital at 834 West Wellington Street, Chicago, for an operation performed about the middle of April — Nichols having just come to Chicago to find a nursing home for his wife, who had been confined for four weeks to a hospital in Miami by a broken hip.

Green's letter goes on to describe his call on Nichols: "Fred Nichols was for years a neighbor of mine in Hyde Park, and I knew him better than I did any '88 men. So this afternoon I spent about an hour with Fred in the hospital. He was operated on, on Friday the 12th, and under a pleasant anaesthesia came to without any discomfort and has felt no pain since. For more than 10 years he has been living in Orlando, Fla. (a town I know well, as I had relatives there and often visited it in the years between 1912 and 1925). I should not have known him as he has aged, having very white hair and not much of it. He is blind in one eye and, as his glasses were accidentally broken, could not read. He was sleeping lightly when I entered, so I took his hand gently and at the touch he woke and immediately said, 'Why, Lonsdale, how glad I am to see you.' He said that in all probability he would not be out of the hospital in less than two weeks. I feared I was tiring him, but he seemed wide awake and, though a little hard of hearing, did as much or more of the talking than I did. I had just returned from a 19 weeks' stay in Florida myself at a place Fred knew, as he had once visited it — the island of Sanibel, noted for its shells.

"The Masonic Hospital is a long way from where I live, way up north, and I am seven miles south. But my visit seemed to cheer him up so much that, now that spring is here, I shall go again. I am 82 myself — a year older than Fred — but I could not have changed much as his recognition of me was immediate. He is a Mason and

through them found a vacancy in the hospital. As visitors he has had some of the women who were teachers under him when he was a school principal. I told Fred that I would write to you. Since he had not forgotten the name of the '88 Secretary, I did not have to remind him of it." — BERTRAND R. T. COLLINS, *Secretary*, Chebeague Island, Maine. SANFORD E. THOMPSON, *Assistant Secretary*, The Thompson and Lichtner Company, Inc., Park Square Building, Boston 15, Mass.

1889

The Secretary has news, but no particulars, of the passing of Alexander S. Ewen of Denver, Colo., on May 6, 1945, and Herman W. Tamkin of Syracuse, N.Y., on September 29. Charles H. Deetz died on January 27. The following is taken from a Washington newspaper: "Charles H. Deetz, 82, cartographic engineer with the Coast and Geodetic Survey for almost half a century, died . . . in Baltimore. A resident of Washington since 1898, he lived at 2504 Cliffbourne place N.W. Born in Sellersville, Pa., Mr. Deetz was educated at Phillips Exeter Academy, . . . Technology, and George Washington University. He entered the Coast and Geodetic Survey in 1889 and for nine years was a field engineer engaged in technical surveys in various parts of the country. In 1898 he transferred to the Nautical Chart Branch here, where he served until his retirement in 1936. Mr. Deetz compiled some of the most important nautical charts of the department, including those of New York Harbor and the Canal Zone. He was the author of numerous technical papers. He was a member of the Philosophical Society of Washington and the former Federal Board of Surveys and Maps. Surviving is a half-sister, Mrs. Frank Wagner, Baltimore. . . ."

Herman Parker died on April 5. The Boston *Herald* carried the following notice: "Herman Parker, 80, prominent yachtsman and former Boston businessman, . . . 7 Redstone lane, Marblehead, died [on April 5]. A native of Boston, he was graduated from . . . Technology in 1889. In his early years he was associated with Parker-Mears, architectural firm, and later with Macullar Parker Company, Boston clothiers. For the past 10 years he was a member of the firm of Burnham & Parker of Marblehead, wrought iron specialists. He was a charter member of the Corinthian Yacht Club and a member of the Eastern Yacht Club."

Bosworth's address is now care of Morgan et Compagnie, Place Vendôme, Paris, France. Miss Lucy Walker's address is 262 Commonwealth Avenue, Boston. Williston was one of the speakers at a luncheon meeting of the Citizens Committee for Universal Military Training held at the Copley-Plaza in Boston on February 20. He made the point that no school or college could in its first years offer training equal or comparable to the scientific training that the Army can furnish youth of special talent, for example in radar, aeronautics, electronics, acoustic transmission, ballistic mechanics, range computation, and many other branches, and denied that education, especially that of scientists, would be delayed by service in the Army. — WALTER H. KILHAM, *Secretary*, 126 Newbury Street, Boston 16, Mass.

1891

By the time you read this, our 55th reunion will presumably be a thing of the past. At this writing we expect between 25 and 30 to attend. We had 44 at our 50th, which was a fine showing. We have mailed to members an up-to-date roster, prepared for us by Harry Young. We propose to publish a reunion book or pamphlet as we have done heretofore on our five-year parties. Our winter dinners at the Algonquin Club have brought out some 15 of our members, and we hope to continue these for an indefinite period.

Gorham Dana, Walter Douglass, and your Secretary had lunch together at the Downtown Club recently. We had not seen Walter for some time, as he moved to Florida and then worked for the government during the war. But we have both known Walter very well over the years, especially Gorham, as they had fine summer homes not far apart in the Sunapee Lake district of New Hampshire. This was not far from Charlie Aiken's family estate on Webster Lake, where I often visited, and where we held a class reunion in 1935.

Walter's hobby (one of them at least, and another was collecting old maps of New Hampshire) was miniature furniture, at which avocation he was a master craftsman. Because of this the government brought him to Washington to work on models, which included localities, bridges, and what have you. As Walter says in a letter following the luncheon: "It was my hobby of making miniature furniture that enabled me to qualify as a craftsman in the model shop at the Engineer Board. This, more than my engineering or building of bridges and buildings, was the stepping-stone to my service in World War II. One never knows *where* our paths may lead, nor *why*. Last month I qualified as a member of the Society of Arts and Crafts at 32 Newbury Street, and some of my miniatures are now in there on exhibition. It may interest you and Mrs. Fiske to drop in some day and see what a '91 Tech man learned to do in Florida."

A recent letter from Bert Kimball, Redondo Beach, Calif., mentioned a call from Greer, whom most of us have not seen for many years. He writes: "Having business in Los Angeles, recently, M. W. Greer '91, took the 20-mile trip to the coast to make me a call. I had not seen him since graduation, but when he mentioned his name, I immediately recognized our old classmate. He was just about as tall, and probably his weight was not far from that of the old days. On referring to the photograph taken in the freshman drafting room, given in the Golden Reunion book, it could be noted he was the same interesting Greer, only, like almost all of us, a little more gray-haired! He could not stay long, as he had to return to meet his wife for dinner. I was glad to see him."

Charlie Ricker writes from Havana that he has not been at all well since last fall. Last December he went from Cleveland to Havana and has been trying to get back in shape again, but progress is slow. His letter reads in part as follows: "Your notice of the class reunion has just come. I want very much to attend and shall if possible, but it will require considerable improvement in my condition. I now have transportation

by airplane to Washington, D. C., leaving Havana on June 6 and expect to stay at my son's house in Arlington, until about June 15 and then go to the Hotel Dudley at Salamanca, N.Y., for a time."

How well many of us remember Clarence Whitney of Hartford! Horace Ensworth, Campbell Moore, Clarence, and the writer all lived within a few blocks of one another for various periods of time. Clarence was a leading citizen and industrialist of Hartford and did much to improve conditions. The Hartford *Times* of February 6 told a long and interesting story of the founding and growth of the Whitney Chain and Manufacturing Company, then celebrating its 50th anniversary. Although Clarence died some years ago, a few passages from this article are worth quoting as showing the part Tech men have played in building up modern industry, to wit: "In its beginnings, the story goes back to Amos Whitney who, with Francis Pratt, established the Pratt and Whitney Division of Niles-Bement Pond Company in West Hartford — one of the leading machine tool manufacturers in the country. Clarence Whitney, son of Amos, learned the fundamentals of American manufacturing the hard way — in his father's factory under the watchful eye of the elder Whitney. That he learned his lessons well is testified to by the fact that Clarence, in his own turn, became the founder of the Whitney Chain Company — today one of the country's leading manufacturers in its field. Clarence E. Whitney might in many respects have been called Hartford's leading industrialist. He came honestly enough to such eminence, for he was in a direct line of succession from a group that included his father, Amos Whitney, Francis Pratt, the elder Billings, Christopher Spencer, and those others who established the fame of Hartford as the home of mechanical genius." — HENRY A. FISKE, *Secretary*, Grinnell Company, Inc., 260 West Exchange Street, Providence, R.I.

1892

The Secretary recently received news of the death of Ferdinand T. Schneider on March 30 in Washington, D.C. His health had been poor during recent years, and he underwent a serious operation last November, from the effects of which he had not fully recovered. To his son, Ferdinand T. Schneider, Jr., the Secretary is indebted for the following account of his life.

Schneider was born in Washington, D.C., on January 10, 1869, in the family homestead, located on the present site of the Garfield Memorial Hospital, the son of Louis H. and Jane Turton Schneider. His grandfather, Jacob Frederick Schneider, the burgomaster of the town of Laufer on the Neckar in Württemberg, came to this country in 1832 with his wife, Catherina, and their five sons and three daughters and established a general merchandising business. Later on, his father, Louis, established a hardware business in Washington. With the aid of a brother's foundry, the business made nearly all the original locks of the United States Treasury Building, many of which may be seen in the Treasury today.

The son, Ferdinand, received his elementary education in the public schools of Washington, later attending Wilkes-Barre

Academy. Graduated from there, he entered the School of Architecture at Technology with our Class. After the completion of his course at the Institute, he made the plans and superintended the construction of four stone dwellings on Connecticut Avenue and Bancroft Place in Washington. After his father's death he was made the executor of his father's estate, and as an aid in conducting the estate he studied law at night in the Georgetown Law School, from which he was graduated with the degree of LL.B., and was admitted to the bar in the District of Columbia. After the death of his brother, Harry, by an accident, he took over a well-drilling business which had been established by his brother and made a success of it. He also organized a wine and fruit company, which he later sold out. Again following his profession of architecture, he designed and built Red Stone Terrace on Connecticut Avenue, and a building on Wyoming Street, Northwest; even after retirement from active practice, he redesigned the Palace Theatre, the John W. Reeves store, and the Little Theater in Washington and entered a competition for the design of the Jefferson Hotel of Richmond, Va., in which he was placed second.

He was a charter member of the Capital Yacht Club and a member of the Corinthian Yacht Club of Washington, where for many years he docked his 45-foot motor cruiser, the *Zenola* (named for the Egyptian Queen). On this boat he enjoyed entertaining his friends, and she was always on the go with a full complement aboard. He was married in 1916 to Ruth Caroline Hall, and they had one son, Ferdinand T. Schneider, Jr. Shortly after his marriage he began spending considerable time during the winters at Miami Beach, Fla., and summers at his summer home at Idlewild, Braddock Heights, Md. An enthusiast for sea fishing, he and his son set a record in 1936. Two days after the hurricane they landed off Miami eight sailfish out of 11 hooked and two weeks later, a 132-pound tarpon after a 50-minute fight, for which feat he received a gold tarpon button from Mr. Stenghaus of the Rod and Gun Club of Everglade City, Fla. Schneider was a member of the Society of the Oldest Inhabitants of the District of Columbia, a member of Almas Temple, A.A.O.N.M.S., and a charter member of the Delta Upsilon fraternity chapter at M.I.T. He was a member of the University Club and was affiliated with All Souls (Episcopal) Church in Washington.

Ralph Sweetser writes: "I have received a letter from the Scranton Lackawanna Trust Company, Scranton 2, Pa., signed by T. Archer Morgan, Vice-president, and reading as follows: 'Yours of April 17, addressed to Henry Storrs Webb, has been forwarded to us as the Executor under his will. Mr. Webb died in Scranton on February 22. You will be interested to know that Mr. Webb left a quarter of his residuary estate in trust, to pay the net income to his sister and niece for life and upon the death of the survivor of them to pay the principal thereof to the endowment fund of the Massachusetts Institute of Technology, Cambridge, Mass.' Harry Webb, Ferd Schneider, Charlie Palmer, and I were together at our 50th reunion, and Webb spent the night with me on his way home. He wrote me on May 21, 1942: 'I had a good time with you three Alumni while

in Boston and thank you for your hospitality while in New York. . . . I am glad I went to Boston, probably my last time there." Webb, Schneider, and I were charter members of the Technology chapter of Delta Upsilon." Webb was graduated in 1892 with the S.B. degree in Electrical Engineering and had been a resident of Scranton, Pa., for many years. — CHARLES E. FULLER, *Secretary*, Box 144, Wellesley 81, Mass.

1893

Katherine Baxter, in private life Mrs. Donald Munson of Boston, daughter of Mr. and Mrs. Jesse B. Baxter, is winning wide recognition as a concert pianist. An account of her musical career appeared recently in the "Gracious Ladies" column of the *Boston Traveler*, which described her as "an artist whose work is a rare pleasure to hear." Mrs. Munson's interest in music began when she was five, and a year later she was started on a career that has led to many concert engagements. She was graduated from Pine Manor in Wellesley and made her musical debut at Town Hall in New York in 1935. She is still studying under a leading New York teacher and is herself teaching on the staff of Wellesley College.

We learned only recently that Frank Elwood Brown, who was associated with our Class for one year (1890-1891) in Course IV, died suddenly on January 12, 1945. He practiced architecture in New Haven, Conn., from 1891 until 1937, when his wife died and he retired to live with his sister, Mrs. Kiles F. Stockwell, in Rochester, Vt. His sister writes that he thoroughly enjoyed country life, and took an enthusiastic part in Grange, Pomona, Farm Bureau, Neighborhood Club, and Masonic affairs.

Rev. Frederic Whitney Fitts, for 37 years rector of St. John's Episcopal Church at Roxbury Crossing, Boston, died on September 21. He attended the Institute for three years as a member of our Class in Course IV. Subsequently, he prepared for the ministry at the Harvard Divinity School and the Episcopal Theological School in Cambridge. After his ordination in 1902, he served as curate of Calvary Church in New York and associate priest of Stephen's Church in Boston until he was appointed associate rector of St. John's in 1907. At the time of our 30th reunion he was a member of, and secretary to, the standing committee of the diocese of Massachusetts, chairman of the department of religious education, and chaplain of St. Luke's Home for convalescents. — FREDERIC H. KEYES, *Secretary*, Room 7-211, M.I.T., Cambridge 39, Mass. GEORGE B. GLIDDEN, *Assistant Secretary*, 551 Tremont Street, Boston 16, Mass.

1895

While we reluctantly report the passing on of our good classmates, one by one, we note that 51 years of postgraduate time has dealt kindly with our membership. Of those who were graduated with the Class in 1895, 46.2 per cent are still living.

We have finally found how Billy Winkley died, on December 30. We quote from the *Standard*, New England's insurance weekly: "William H. Winkley, retired manager of the Boston Board of Fire

Underwriters and a prominent New England fieldman for 25 years prior to his association with the Board, died in Medford, Mass., on Sunday, December 30, 1945, of a heart attack brought on by shoveling snow following the previous day's storm. He began his insurance career shortly after his graduation from . . . Technology with a degree in Naval engineering. His first post was with the Hartford Fire Insurance Co., which he served as a New England special agent for about twelve years. From 1907 until 1921, when he was made manager of the Boston Board, Mr. Winkley served as special agent of the Insurance Co. of North America in this territory. As manager of the Board, he succeeded H. Belden Sly, now secretary of the Eastern Underwriters Inspection Bureau. Mr. Winkley was manager of the Board for 15 years or until his retirement in 1936, when he was succeeded by the late Isaac Osgood. He brought to his Board position a thorough grasp of insurance conditions and his administration was able and impartial. He served as president of the New England Insurance Exchange for nearly three years, being chosen to complete the unexpired term of the late Frank N. Battalina in April, 1919, and being reelected for a two-year term in 1920. He also served the Exchange on various important committees. He is survived by his widow, two sons and a daughter." Billy was one of the trio including Barry and Sheridan who took Course XIII, in Naval Architecture. These three were among the first graduates of this famous course, Barry now being the only survivor.

Gene Clapp attended the Alumni Banquet last February, and at the time he was apparently holding his own. Through him your Secretary learned of the passing of Winkley, and we must now record the necrology of Gene Clapp. He died suddenly on March 18, at his home, 772 Humphrey Street, Swampscott, Mass. He was graduated from the Boston English High School and entered Technology with our Class. At the time of his death he was treasurer of the Penobscot Chemical Fibre Company of Boston. When he left the Institute, he went to work in the mill of the Penobscot Chemical Fibre Company at Great Works, Maine, at \$1.25 a day. Having worked through the different departments, he finally became superintendent. Later, he returned to Boston as vice-president of the company. His business connections were many and his travels far-flung, as his special problem was improving the manufacture of pulp bleach and reclaiming paper. For eight years he was a member of the First Corps of Cadets. His business interests connected him with the American Chemical Society and the Electrochemical Society. He was a member of the Algonquin Club, the Joseph Warren Commandery, the Beacon Society, the Eastern Yacht Club, the Senior Golf Association, the First Corps Cadets Veterans Association, the Country Club, the Thursday Club, and the Tedesco Country Club of Swampscott, where he was chairman of the grounds committee. He was buried from the Old South Church, in Copley Square, Boston. Gene took the greatest interest in his golf connections and was considered an expert in the layout and operation of golf courses. He was very loyal to his Class, to the Institute, and to his great host of friends.

Fred B. Cutter '98 of New York wrote your Secretary recently that he had been informed that Frank C. Schmitz of Muncy, Pa., had passed on. When the facts are known, they will be recorded in these columns. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass.

1896

With the expectation that the June issue of *The Review* will appear promptly on the first day of the month there is opportunity for a final reminder to classmates that our 50-year reunion will be celebrated at East Bay Lodge, Osterville, Mass., on Thursday, June 6, and Friday, June 7, with the Class coming to Cambridge for Alumni Day, Saturday, June 8. Another reminder is for the special class contribution to the Alumni Fund in our 50th year. Already a goodly number of classmates have responded with contributions ranging from \$1.00 to \$2,000, and it is definitely assured that we shall exceed our quota of contributions by at least 300 per cent. A special effort is being made to get as many contributions as possible, no matter how small, in order to boost our quota of number of contributors.

The annual gathering of New York classmates was held at the President Tavern on April 17, with Bakenhus, Freedman, Gaylord Hall, Locke, Rockwell, Sager, Stevens, Tilley, and Trout in attendance. It was too far for Arthur Baldwin to make the trip from Virginia. Paul Litchfield was in Arizona. Bradley Stoughton was obliged to be in Bethlehem, Pa., that night. Will Coolidge was scheduled to broadcast that evening. Melliush, who has gone on a new job with Barker and Wheeler in Albany, found it impossible to get away. Partridge was still ill in the hospital, and Ruckgaber was also under the weather. Rutherford had planned to attend before leaving for Australia, but in order to arrive in San Francisco two days ahead of the time of sailing for Australia, he had to leave New York on April 15 and thus missed out on the meeting by two days, which made him very sad. Bill Dorrance was another man who had hoped to be able to change a previous engagement and thus be with us, but he found it impossible to make the change. During the course of the evening, messages signed by all those present and reading, "Greetings! Sorry you could not be with us. Best wishes," were prepared to be sent later by Bakenhus to Melliush, Partridge, Ruckgaber, and Rutherford. Rutherford had been living in Brooklyn through the winter. He had finally decided to make the voyage to Australia to visit his people there, whom he had not seen for many, many years. It is his expectation that he will return to the United States later on. The evening went by all too rapidly and most pleasantly with reminiscences of by-gone days and discussions of present-day problems. Hall exhibited a brochure which he had written and had had printed in 1945 on the subject of Jonathan Fisher, a prominent citizen of Newburyport, Mass., who was a notable figure in his day and accomplished much.

Your Secretary, in his role of Alumni Secretary, visited the Technology club of Springfield, Mass., on April 12, and there had the pleasure of meeting two classmates, Lewis B. Breed and Marion Lewis Lee.

Mrs. Lee had had triple misfortune during the past year in the loss of her husband, brother, and sister, and she is contemplating moving from Massachusetts to live near her son in the West. The Secretary has turned over the annual class contribution of \$50 to the M.I.T. Alumni Association Advisory Council on Athletics and has had grateful acknowledgment from Ralph T. Jope '28, the Secretary.

Lythgoe has sent a reprint of his paper on "Pharmaceutical Accuracy," which appeared in the *Quarterly Bulletin* of the Association of Food and Drug Officials of the United States, Vol. X, No. 1, January, 1946. He has to be in Atlanta, Ga., to attend a convention at the time of our reunion, which makes him very sad. Wayne has been on the move recently and visited Billy Andrew in Cincinnati. He also reports that Joe Stickney has recently become a grandfather. Classmates will learn with great regret of the death of Irv Merrell's wife, which was reported by Con Young as having occurred late in March in St. Petersburg, Fla. Con and Mrs. Young, together with Joe Clary and Mrs. Clary, attended the services. Her health had not been of the best for some time, and a gallstone operation early in the year proved to be too much for her. Billy Haseltine wrote from Anaheim, Calif., where he and Mrs. Haseltine have apparently been spending the winter, that he had had a very enjoyable call on Steve Crane in Pasadena, and they seemed to take mutual satisfaction in having had recent operations and in making good recoveries. Billy felt that it was too far for him to make a trip across the country for our reunion. Henry Tozier and Mrs. Tozier have finally been able to get accommodations in Rochester, N.Y., so that upon returning from Florida they will be in Rochester throughout the summer. W. S. Matrocks has now moved to Lyndon, Vt. Karl Pauly has been away from Schenectady this spring, and the latest communication from him was from Alabama. He did not indicate whether he had been traveling through the South or had gone to Alabama for a sojourn.

Dan Bates also had a short holiday in the South during the spring but returned to Philadelphia in April. Dan, or Colonel Bates as he was called, has received considerable publicity of late. He retired from the presidency of the Cold Spring Bleachery at Yardley, Pa., in February to become chairman of the board. He continues as director of the United States Finishing Company. Dan's career briefly covered a year's apprenticeship with the Pacific Mills in Lawrence, followed by work with Joseph Bancroft and Sons Company, where he was manager of the Kentmer plant until 1912, when he became general manager of the Lewiston Bleachery in Maine. He acquired the Cold Spring Bleachery in 1923.

Colonel Bates made an enviable record in World War II. When his repeated efforts to return to the Army in uniform were futile, he became, at the age of 69, a teacher of mathematics at the University of Delaware, in spite of the fact that he had never taught before. His pupils were 17-year-old members of the Army Specialized Training Program, and he served entirely without pay. The first winter he rose every morning at 6:30, in order to leave Centerville in

time to reach the morning class at Newark. He drove through the most severe weather without missing a class. For the second winter, however, he and Mrs. Bates took a room in Newark. His job continued all the year round, even through the hottest months of the summer. As a tribute to his service, he was presented by W. Owen Sypherd, Acting President of the University, with a certificate of honor, the first of its kind ever given at the University. The gift was a complete surprise to Dan. Incidentally, one of Dan's daughters is the wife of Peter Muir, National Broadcasting Company war correspondent and author, and is herself an accredited correspondent. The couple recently returned from India to visit another daughter, Mrs. Marshall Cole of New Hope, Pa. Colonel Bates has also one son, Charles Theodore Russell Bates of Tucson, Ariz.

Responses to date indicate that we shall have a fine attendance at East Bay Lodge. Favorable replies have come from Anderson, Bakenhus, Arthur Baldwin, Harry Baldwin, Bates, Bragg, Breed, Clifford, Cluett, Will Coolidge, Damon, Davis, Dorance, Driscoll, Eynon (from San Diego, Calif.), Harkness, Harrington, Hedge, Hersey, Hewins, Frank Howard, Perry Howard, Hunt, Jackson, Leighton, Litchfield, Locke, Mansfield, Melluish, Morrill, Pierce, Pillsbury (from Vancouver, B. C.), Rockwell, Rundler, Russell, Sager, Sears, Smetters, Haskell Smith, Herbert Smith, Charles E. Stamp, Stearns, Tilley, Trout, Tucker, Wayne, and Young. A number of the fellows will be accompanied by their wives, and there are also some fellows who have not yet been heard from, like Ed Barker, Myron Fuller, Jacobs, and others, who are pretty certain to be with us. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge 39, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge 38, Mass.

1897

George R. Wadleigh, II, who for 24 years was manager of the engineering department of the West Virginia Pulp and Paper Company, announces that he is entering the consulting engineering field relating to the pulp and paper industry. Having reached the retirement age under the excellent plan recently set up by the West Virginia Pulp and Paper Company, Mr. Wadleigh severed his connection there as of October 1, 1945. For 10 years George was manager of the engineering department for the Bemis Brothers Bag Company of Boston and St. Louis and in that period directed the engineering work in their paper and textile mills and power plants. He left Bemis Brothers to become associated with the West Virginia Pulp and Paper Company. During his 24 years with the latter company, its pulp and paper mills have more than doubled their capacity, involving the expenditure of many millions of dollars at the six plants. All the engineering work, involving process, steam, and hydroelectric plants, was under his direction. He also supervised the power operation and distribution and the development of adequate water supplies. George has been for 25 years a member of the Technical Association of the Pulp and Paper Industry, for several years a member of its finance committee, and often active on

many of its other committees. He is also a member of the American Society of Mechanical Engineers, the Engineers Club of New York, and the Technology Club of New York. George has now become associated, under his own name, with Fred-eric C. Clark, pulp and paper consultant, at 7 Dey Street, New York City. With their long experience in mill design, construction, and operation they will bring to the pulp and paper industry a complete service in the consulting engineering field. We are sure that the best wishes of his classmates go out to George in his new connection, and that he will achieve complete success.

In a recent letter, Irenée du Pont writes as follows: "Your letter of January 23 was awaiting my return. I have formed the habit of spending about half my time in Cuba, especially the winter season, as my place there is very good for old men." Now what do you think of that, fellows, referring to his contemporaries as "old men"? I'll have to speak to Irenée about that. The letter continues: "It has enabled me to perfect certain phases of golf, namely, all the bad habits. You will recall that I won the golf tournament at the last reunion with a score of 97. That was before 'b. h.' dominated my game. I retired as president of the Du Pont Company 20 years ago; and now, 20 years later, the title of honorary president has been conferred upon me. All my eight children are married and settled down, and at the last census I had 22 grandchildren. I favor a reunion next year and hope that many of the Class will be present."

The Secretary has received a letter from E. A. Sumner, who has just returned to New York City from the South, where he spends the winter. He hopes to attend our reunion in 1947 if the date should fall between his return from the South about April 15 and his departure for Europe for three to five of the summer months. We have written Ed that the reunion will probably be held during the first week in June. — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass.

1899

Bernard Herman says he doesn't think his record is of much interest to anyone. But you that read this will probably be a better judge of that than he. Bernard got his preparatory school training in the Washington, D.C., high school. After graduation from Technology, he spent a year with the Edge Moor Bridge Works at Wilmington, Del., as draftsman, going from there in the same capacity to the bridge department of the Baltimore and Ohio Railroad at Baltimore for three months. October, 1900, found him with the Southern Railway Company in the bridge department, where he advanced progressively through the positions of chief bridge inspector, engineer of bridges, principal assistant engineer, acting chief engineer, and finally chief engineer, Maintenance of Way and Structures — all by September, 1911. The year 1917 found him chief engineer of the Montana, Wyoming and Southern lines east of the Southern Railway System. The next step was to become assistant to the vice-president, Maintenance of Way and Structures, and finally chief engineer of the system in December, 1924, in which position he remained until

his retirement on February 1 of this year at the age of 70. Bernard has one son, born in 1912. He occasionally sees Carroll Brown, who is with the Federal Government in Washington, and John Ferguson, consulting engineer at Hagerstown, Md.

On a recent trip to Columbus, Ohio, your Secretary took the pains to look up the only '99 member in that city, Phil Burgess. Phil used to be in the sanitary engineering division of the Ohio state health department when your Secretary was in charge of the department's laboratories in the later years of the past decade, but we haven't seen much of each other since. He hasn't changed much at that, except like most of us, he has put on some weight, and his hair, what's left of it, is sprinkled with snow. Phil, modest as usual, wouldn't come across with many facts concerning himself and referred me to "Who's Who"; so here is his record: He came to Technology from the Newtonville, Mass., high school and has one daughter, Anne. Positions: assistant engineer, C. W. Leavitt, New York, 1899-1900; City of Philadelphia, 1900-1901; water superintendent, Jersey City, 1901-1903; Hering and Fuller, 1903-1904; City of Cincinnati, 1904-1905; and engineer, Ohio state department of health, 1906-1910. He then formed the partnership of Burgess and Niple and since 1910 has been president of the Burnip Construction Company. He is director of the Consumers Water Company, the Beaver Valley Water Company, the Shenango Valley Water Company, and the Associated Public Utilities Corporation; member of the American Society of Civil Engineers, the American Water Works Association, and the New England Water Works Association; and author of *Water Purification in Ohio*, 1910, besides many articles in professional journals; as associate water consultant he assisted in the preparation of a report on the Ohio River Basin for the National Resources Commission, 1936. — BURT R. RICKARDS, *Secretary*, 381 State Street, Albany, N.Y. ARTHUR H. BROWN, *Assistant Secretary*, 53 State Street, Boston 9, Mass.

1900

Leeds dropped in on his way to the American Society of Civil Engineers convention in Washington in April and looks the same as he did years and years ago. He left the Class in the junior year, going to West Point, from which he was graduated in 1903, and returning to Technology for his S.B. in 1906. He has seen a great deal of the military, in both World Wars, I and II, and we expect a full report some day of his activities. His firm is Leeds, Hill, and Jewett of Los Angeles.

A note from Jim Batcheller reads: "Many thanks for your letter of March 1, and the news of June 8 as the alumni reunion date. I do still believe I shall be able to make the trip East, and of course if I do, I'll plan to attend with you all. I judge there will be some general information circularized in a month or two? If not, please keep me posted. Best regards to you and any other 1900 men you meet."

Jim Patch writes in: "Here I am, back in Carlisle. I accomplished the first stage of recovery in good time, and now I have a week or two of loafing before I do very much in the way of work. In April, I with-

draw from the regular routine at the Patch Company and expect to devote my attention more especially to the farm. Later in the season we want to plan for you and Mrs. Cotting to have a visit with us."

A notice from the Register informs us of the death on February 5 of James P. Sprague, IV, in Kansas City, Mo. — Joe Draper sends his best to all by way of a card from Palm Beach, Fla. He writes that Cy Hapgood looked in on him and that they both were getting through the winter in good shape. — C. BURTON COTTING, *Secretary*, 111 Devonshire Street, Boston 9, Mass.

1901

The following is quoted from the *Civil Engineering* for January, reporting the award of the Rudolph Hering Medal to Langdon Pearse for his work as committee chairman on the 1944 report of the American Public Health Association on sewage treatment: "Langdon Pearse, who is widely known in the field of sanitary engineering, is this year's recipient of the *Rudolph Hering Medal*. After graduating from Harvard College, with the degree of A.B. in 1899, he studied at . . . Technology, receiving the degree of B.S. in Civil Engineering in 1901, and the degree of M.S. on 'Studies in Sanitary Science and Advanced Structures,' in 1902. Following short engagements with the State of Massachusetts, he served as assistant engineer with the Commission on Additional Water Supply, New York City (1903), the Augusta (Me.) Water District (1904), and as personal assistant to George C. Whipple, on water supply investigations of Jersey City and Cleveland, Ohio. Then, for over four years he was assistant engineer on the improved water and sewage work at Columbus, Ohio, and for one year with the Peoples Water Company, of Oakland, Calif. Since February 1909, he has been sanitary engineer for the Sanitary District of Chicago, in charge of sanitary investigations and sanitary engineering work, concerned with the construction, design, and operation of various intercepting sewers and sewage treatment works. He has appeared as expert witness for the Sanitary District of Chicago in the lake level litigation, on sanitary subjects, and in various congressional and legislative hearings; also as expert witness for the states of Illinois, New Jersey, and Connecticut in connection with litigation. His duties have also covered the development of the sewage treatment program of the District to supplement dilution, and in connection therewith he has been concerned with every sewage treatment works the Sanitary District has built, in more or less degree, and with its experimental work on sewage treatment and industrial wastes. In 1938 Mr. Pearse served as editor for an anniversary volume for the Federation of Sewage Works Associations, entitled 'Modern Sewage Disposal.' He has also prepared various papers on sewage treatment for technical societies, and for over 15 years has served as chairman of the Committee on Sewage Treatment of the American Public Health Association. He has been a Member of the Society since 1913, and for the past four years has been chairman of the Society's Committee on Sewage Treatment." Langdon says: "Frank Puckey is still active in

the practice of architecture (firm of Puckey and Jenkins). He specializes in hospital and institutional work. I see him occasionally lunching at the University Club of Chicago. He is still an ardent golfer."

Warren Bickford, until January 1, district manager for the Westinghouse Electric Supply Company, Pittsburgh, will retire as of July 1. He has two daughters: Mrs. Washington Frazer of Providence, R.I., who has two children, a boy and a girl; and Mrs. David McCargo, Pittsburgh, Pa., with two boys and two girls. Warren writes that he will spend the summer at his cottage at Centerville on Cape Cod. He says: "If any of my classmates are near by on the Cape, I hope they will look me up in the telephone directory and give me a ring. I'll have nothing to do but loaf!"

Roger Wight says: "My work as manager for Maine for the Travelers Fire Insurance Company has continued to be very interesting, and I have not thought of retirement at the present time. If, therefore, any members of the Class plan to make vacation trips to Maine, I hope they will let me know and will have time to call at the Chapman Building in Portland. Recent letters received from Ted Lange, Joe Evans, Al Higgins, and Charlie Tufts have indicated that each of those men is looking forward to our 45th reunion and hopes to be present. That also goes for the writer, who is naturally very much pleased that the New Ocean House at Swampscott has been selected as our meeting place on June 6 and 7."

W. W. de Berard, who has been city engineer for Chicago since 1941, writes: "I have charge of the waterworks system and the city's 80 bridges. The water system comprises a dozen pumping stations supplied with Lake Michigan water from four cribs located two to three miles offshore. A new 320-m.g.d. filtration plant costing \$24,000,000 has been in partial operation since October. Of the 80 bridges, 56 are movable; two over the Chicago River which were under construction until held up by the war are now going ahead. Ralph Whitman and I found ourselves again, after 45 years, on the same waterways division executive committee of the American Society of Civil Engineers. Recently, he suddenly passed away at his Danbury, Conn., home. My son, Emmons W. de Berard, Lieutenant, U.S.N.R., is soon to be back in civilian clothes after 28 months with the Seabees and Public Works. My daughter now lives in Sacramento, Calif., on a recently acquired poultry ranch, where I spent my Thanksgiving and incidentally learned how to pack 30 dozen eggs in a case and the amount of protein to make the 3,000 hens produce 1,000 eggs a day. To keep the record straight, I want to report that both son and daughter have three children each: three boys and three girls. Mrs. de Berard and I live downtown in the Continental Hotel (once the Medinah Club) so that I can walk to work at City Hall. Langdon Pearse, of our Class, was recently elected honorary member of the Federation of Sewage Works Associations, of which I am treasurer."

Phil Moore reports: "My ninth grandchild and third grandson has arrived; I might even go so far as 10 grandchildren this year." — A note from Ted Taft reads:

"Last July, I was retired from active service with the title of professor emeritus. I am, however, continuing my work by teaching half time and shall probably keep on in this way for the next few years. It is a pleasant arrangement, and I like it. I see Willard Dow at the Alumni Council meetings, which I have attended regularly."

I was pleased to get the letter from Nat Patch which is given below: "I am more or less active as secretary and advertising manager for the Lumen Bearing Company, Buffalo, N.Y., with whom I have been connected ever since leaving the Institute; however, with a ticklish heart, which requires frequent resting, and also with failing eyesight, I find little opportunity to devote myself to my business as I once did. I confess I don't like it. I much prefer to be really active and feel that I am accomplishing all that one could in the jobs I hold. As a director of the company, which I have been for many years, I have seen it develop and grow and pass through the vicissitudes caused by depressions and the like. It has been a most interesting experience. Through the years I have had the pleasure of contacts with many Technology men, some active in work with us, and among them, of course, H. P. Parrock, who for a period was actively connected with our company. Malcolm Corse '99 was also an associate. Both of these boys have passed to their final reward, and I know their many friends miss them sorely."

"I wish I could attend the forthcoming 45th reunion. At the time of the 40th, I definitely planned to be present this year, but my health will not permit me to consider the trip. I did enjoy the 40th and shall hold it as a most pleasant memory as long as I live. It was a real pleasure to see those who were there after so many years, and my old friend V. F. Holmes was very kind to me, as were Bill Vermilye and Lamot du Pont, and many others. In the class notes mention was made of the sea food available at Swampscott. I dearly love sea food and only wish I could enjoy that pleasure this year with the rest of you, for I do remember with a great deal of delight the soft-shell clams and lobsters that I had at the New Ocean House. Sea-food is available in Buffalo only at exorbitant prices, and we enjoy it more or less in proportion to its high price. I hope that you can convey to the boys at the reunion this year my sincere regrets that I cannot be present and my best wishes for a successful and happy reunion for all."

Bob Williams, as engineer for the Submarine Signal Company, designs submarine signal apparatus, fog horns, and sonic milk oscillators. He writes: "Most of my work is in Boston, but occasionally I visit the Portsmouth Navy Yard and Submarine Base at New London, Conn. I attended the Alumni Banquet on February 23. It was very interesting, and nearly 1,200 were present, of whom I was the only '01 man, I am sorry to say."

Albert Casani retired on January 1, after 43 years of service with the American Bridge Company in Pittsburgh. He writes: "I had the pleasure of being present at a meeting of the local chapter of the American Society of Civil Engineers here in Pittsburgh on February 5, when Fred W. Claflin, a classmate at Technology, received a certificate of life membership in the

society. Mr. Claflin is a partner in the consulting engineering firm of Gray and Claflin of Johnstown, Pa., and is still 'going strong.'"

Ed Seaver writes: "I am taking life a little easier now and am spending my winters in Clearwater, Fla., and see Al Higgins quite often in St. Petersburg."

S. Winthrop St. Clair writes: "I am back in our Boston office — Sturgis Associates, Inc. (architects), of which I am president. This is the organization I joined in 1905. The office, under several names, has given continuous service since 1853. We believe it is the oldest architects' office in the country. We have \$2,000,000 worth of work. I have been on work in Florida — first as project manager in construction of the Naval Air Station at De Land, which we built in record time; then, until last November, as assistant to the Public Works officer in Melbourne, which means I was in charge of construction operations as chief civilian. My home is in Miami, Fla., but I can't seem to spend much time living there. For about four years I ran a branch of our office in Miami. My spare time in Melbourne (very spare) I spent cultivating a jungle, into which, when first purchased, I did not dare walk for fear of rattlesnakes. It has plenty of interesting plants, from palm trees to night-blooming cereus, and many birds and animals. I am at heart a Floridian, and every day spent in the snow storms reminds me that the Pilgrims settled in the wrong place."

William Holford gives his occupation as "practice of architecture (as formerly)." He continues: "Side lines — gardening, sketching in water color and oil, assisting in the Boy Scout program as member of the camping committee and as honorary vice-president of the Portland area council of the Boy Scouts of America. Three children — one married daughter in New York; one daughter with the Associated Press in San Francisco; one son, about to be released from the Navy as commander, Medical Corps, U.S.N.R. Enclosed is a clipping regarding my former partner."

The death of Ellis F. Lawrence on February 27, in Eugene, Ore., was reported to me by his son, H. Abbott Lawrence (M.I.T., 1932), who has been in partnership with his father the last several years and will continue their architectural practice. The obituary below, quoted from the *Portland Journal of Commerce* for March 2, was sent to me by his family and also by William G. Holford, his former partner. "Services will be conducted . . . for one of Oregon's most beloved architects, E. F. Lawrence, dean of the University of Oregon School of Architecture. This announcement was made by his son, Abbott Lawrence, partner, who will carry on the Portland architectural service of Lawrence & Lawrence. . . . Dean Lawrence died . . . of a heart attack shortly after being stricken at the faculty club on the Eugene campus. He had been professor at the architectural school since 1914. Although not announced publicly, a new architectural firm — Lawrence, Lawrence, Tucker & Wallman — was formed in Portland just prior to his death."

"Members from every phase of the construction industry feel the loss of Mr. Lawrence, having known him as the co-founder of the Builders Exchange Coopera-

tive and Oregon Building Congress. He was a member of the Portland city planning commission, the Oregon State Teachers' Assn., the Association of College Schools of Architecture, the Pacific Coast League of Architects and the Portland Architectural Club. He had served as vice-president and director of the American Institute of Architects. In addition to designing many of the buildings at the University of Oregon following his education at the Massachusetts Institute of Technology, Dean Lawrence designed Portland Westminster Presbyterian Church. As a member of the firm of Lawrence, Holford & Allyn (of Stokes & Allyn now), he helped plan Episcopalian mission buildings throughout the state. He worked with Engineers John Cunningham & Associates in planning Camp Adair. In addition to Abbott, Mr. Lawrence is survived by a son, Denison at San Rafael, Cal., and another son, Amos, at Seattle, as well as his widow in Portland and four grandchildren."

Robert M. Derby reports that Reuben B. Clark died on April 3, at Ardmore, Pa. He also contributes the following facts about his life: "Reuben Bacon Clark, who was president of the Class in its freshman year, died at Ardmore, Pa., on April 3, aged 66. He was born at Walpole, N.H., on July 22, 1879. At the Institute he took the Course in Naval Architecture but left to go with the New York Shipbuilding Company, where he worked for several years in a number of departments. In 1904, he became manager of E. H. Godshalls and Company, yacht, launch, and engine builders. From 1907 to 1917, he was engaged in independent work, designing fast power boats, and in consulting and gasoline engine work. In 1918, during World War I, Clark joined the Navy and became an assistant naval constructor with the rank of lieutenant. He was assistant inspector of hull material, Eastern District, in charge of auxiliary machinery, ship fittings, and machine tools. The war over, he engaged in the automobile business until 1930, when he returned to his former field and went into the yacht brokerage business in Philadelphia, as correspondent of Sparkman and Stephens, Inc., of New York, and continued in this work until his death."

"He was a member of the Society of Naval Architects and Marine Engineers, the Corinthian Yacht Club of Philadelphia, the Military Order of Foreign Wars, and the Saint Anthony Club of Philadelphia, of which he was vice-president for a number of years and a member of the board of governors. He is survived by his wife and three sons — Reuben B. Clark, 3d, Edward G. Clark, and John D. Clark, and two grandsons, Reuben B. Clark, 4th, and Edward B. Clark, Jr. Reub Clark, as so many will remember him, was outstanding with unusual personal charm and kindness toward all. He will be missed."

As a last reminder to those members of the Class who have been undecided about attending our coming reunion, I will repeat that our 45th reunion will be held at the New Ocean House, Swampscott, Mass., on June 6 and 7 with the class dinner in the evening of June 6. I hope to see you all there. — GUY C. PETERSON, Secretary, 788 Riverside Drive, New York 32, N.Y. THEODORE H. TAFT, Assistant Secretary, Room 3-266, M.I.T., Cambridge 39, Mass.

1902

Another of our classmates has passed away. Clyde Richmond Place died on March 28. Clyde had been in poor health for several years, and his death did not come as a surprise to those most closely associated with him. He had been very successful in his profession, and New York has many monuments to his ability. The following, taken from the New York *Times*, gives an excellent summary of his life and activities: "Clyde R. Place, consulting engineer, died here . . . in St. Clare's Hospital. His age was 68. Mr. Place was widely known as a specialist in engineering design, having planned the mechanical, electrical, elevator, air-conditioning and power-plant systems for many public buildings, including churches, hospitals, industrial plants, colleges, hotels, clubs, museums, and railroad stations. He had done consulting engineering work for Rockefeller Center, the Grand Central Terminal, the National Gallery of Art in Washington, Peking (Peiping) University, China; the British Museum, London; Thomas Jefferson Memorial, Washington, and other well-known structures. Born in Mount Upton, N.Y., he was graduated from . . . Technology, having been president of the class of '02."

"In 1930 Mr. Place was the recipient of the National Award of the Silver Beaver for distinguished volunteer service as chief consulting engineer of the Ten Mile River Boy Scout Camps at Tusten, N.Y., among the world's largest. The award was presented to him by the late President Franklin D. Roosevelt, when Mr. Roosevelt was Governor of New York. Former Mayor Fiorello H. LaGuardia, in 1939, cited Mr. Place for exceptional public service to this city for his work as consulting engineer to the housing and building program. During the recent war, Mr. Place turned his talents to the design and construction of Army camps, training centers and port facilities."

"He served on many committees dealing with the codification of regulations and standards governing heating, ventilation, plumbing, power and elevator service. He was a former president of the First Avenue Association and had served as director of the Boy Scout Foundation of Greater New York, the New York Building Congress and other groups. He leaves a widow, Mrs. Maybelle Boyd Place; two daughters, Mrs. H. Ware Knudsen and Mrs. Richard Allan Mason, and a son, John Foster Place."

Les Millar called in to see your Secretary, and it seems that he is now with the War Shipping Administration at 40 Broad Street, Boston, five days in the week, but commutes to New York for the week end. — Louis Cates is to have the honorary degree of doctor of science conferred on him by the board of regents of the University of Arizona. Taking place on May 22, this honor will be history when these notes are read. — BURTON G. PHILBRICK, *Secretary*, 246 Stuart Street, Boston 16, Mass.

1903

Early in March we received notice of the death of Louis Winfield Adams, II, of Chicago, Ill., on November 20. Adams had been with steel companies ever since graduation. He began with the Illinois Steel

Company as steam expert at the Joliet, Ill., works, became superintendent of boilers for Lackawanna Steel in Buffalo, N.Y., from 1904 to 1906, then went back to Illinois Steel at its South Works as assistant superintendent of the rail mill from 1906 to 1909. From 1909 to 1917 he was assistant superintendent and superintendent of the merchant mill at Bethlehem Steels' Saucon and Lehigh plants. In 1917 and 1918, he was general superintendent for Nova Scotia Steel at its New Glasgow, Nova Scotia, plant. He came back to the States in 1918 and was manager of the Ashland Iron Company's plant at Ashland, Ky., until 1922. From 1925 to 1927, he was superintendent of the United Alloy Steel Company's bloom and merchant mills at Canton, Ohio. In 1927, he was back with the Carnegie-Illinois Steel Corporation for three years as assistant superintendent of rolling mills at the Gary Works, and for the past 15 years at its South Works as superintendent of rolling mills and 54-inch blooming and 52-inch structural mills. A long and successful career he has had in the steel industry. Apparently Adams was closely tied to the mills, as he was unable to attend any reunions in recent years, although he wrote in 1937 and also in 1938 that he hoped to come East.

W. E. Mitchell, VI, had a pleasant experience in Japan recently, while on a trip there with the United States Strategic Bombing Survey. He met the chief engineer of the Tokyo Electric Supply Company, one Takai, who, 17 years before, had worked for Mitchell for a six months' training period. They had dinner together.

H. S. Morse, I, wrote an interesting personal letter to us and enclosed a newspaper clipping in which the history of the Indianapolis Water Company was reviewed at the end of 75 years of service to its community. The company — of which Morse has been manager for some 20 years — is one of the exhibiting industries which will take part in the permanent display sponsored by the Chamber of Commerce in the Indianapolis Union Station. Morse's two children are married, and each has a son, putting H. S. in the grandfather class.

We are planning a notice in regard to the June Alumni Day which you will receive before you read these notes. Let this be a further reminder, and if you paid no attention to that notice and now find you can be in Boston on June 8, don't hesitate to pack a grip and come on. Some of us show some resemblance to our appearance in 1903, but most of us have changed, just as you too, have. — FREDERIC A. EUSTIS, *Secretary*, 131 State Street, Boston 9, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, 441 Stuart Street, Boston 16, Mass.

1909

When this June number is distributed, it will be a few days before June 8, Alumni Day. This year, the day will have much meaning for '09, for Paul, our versatile and genial Secretary, is coming up from old New York just to see us Bostonians again. Let's make the '09 table at the Stein-on-the-Table Banquet at the Statler a real one and let Paul know how glad we are to see him up here.

Recently you all have received the invitation to contribute to the Alumni Fund. This not only gives us an opportunity to

pay some of our back indebtedness to the Institute but also helps the Institute to continue the great teaching and scientific work for which it is noted. Carl Gram, X, our President, takes special interest in our contributions for he is our class agent. When the day of reckoning comes in the fall, let '09 be up there at the top.

John Mills, VI, who recently retired from the Bell Laboratories, is still far from being retired as a contributor to society, for he has lately added another to his long list of publications. *The Engineer in Society* by D. Van Nostrand Company may give the answers to the questions, "Is the engineer the hope of our civilization?" "How can he bring to our social and economic problems the power and objectivity that they have applied to our physical universe?"

On December 13, B. Edwin Hutchinson, III, addressed a dinner meeting, held by the Detroit Bureau of Governmental Research as part of the annual conference of the Governmental Research Association, on the subject, "Citizen Responsibilities of the Individual." B. Edwin is vice-president and chairman of the finance committee of the Chrysler Corporation. The New York *Times* of April 13 showed a picture of heads of the big automobile manufacturing companies sitting in and "trying out" some of those very early, non-stream-lined models during the celebration of the Automotive Golden Jubilee being held at Detroit. In the foreground sat B. Edwin beside George W. Mason, Nash president, in a 1902 Nash. William S. Knudsen, former War Production Board chairman and General Motors executive, was also in the distinguished group.

On Monday, April 8, at Atlantic City, the American Chemical Society began the first national meeting which it has held since 1944. At the opening session Brad Dewey, X, its President, spoke on "The Chemist and the Public." As a member of the Cambridge school committee also, Brad is making his good influence felt, for he proposed the resolution by which the committee rescinded its former order, forbidding teachers to join organizations devoted to combating racial prejudice. This order was a travesty in that it deprived teachers of the great American rights of freedom of speech and freedom to work for a cause. Brad's resolution, however, went further and urged the teachers to work for better racial understanding.

Paul writes: "Barging merrily across the Jersey meadows on the 10:02 the other morn, I was peacefully perusing the faithful *Times*. All I ever know is what I read in the papers, which I greatly enjoy reading. And there my eye caught a headline: 'Desmonds are honored.' Of course, I was all of a twitter. There could be but one family to which that title could truly apply. And so it was — our scintillating Tom, I, and his Alice. Here's the citation from Rochester, N.Y., on April 14: 'The Rochester Museum of Arts and Sciences announced . . . the award of two of six annual fellowships to State Senator Thomas C. Desmond of Newburgh and his wife, Mrs. Alice Curtis Desmond. Senator Desmond, a Republican, was selected for his contributions in the field of social legislation, the museum said, and Mrs. Desmond for her achievements as author of several books on historical subjects. The fellow-

ships are to be presented May 9.' The readers of class notes hear from time to time of Tom's work in proposing constructive legislation, and we all know about Alice's books, particularly for children, on American historical themes. Besides, we all know of Tom's prowess in forestry and garden lore, particularly in the neighborhood of his estate near Newburgh. What a man and what a family! More power to Tom and Alice!

"I know well a large importing house at 285 Madison Avenue here in New York. I drop in there often. That is the address of Molly Scharff's office back along. Calling on my old friends the other morning, just for the mischief of it, I went to the directory of the tenants. I wondered whether Molly were still listed. There he was: Maurice R. Scharff — 1005! I called at 1005, but it was lunchtime, and the door was locked. I left my card and dropped back again. And there Molly was, as serene as a May morning, and I still cannot tell whether I was happier to see him or he to see me. We embraced each other like the good friends we are. Molly looks splendidly — handsomer than ever! I wondered whether I should snap to attention and salute as I entered Colonel Scharff's sanctum. But all of you can guess the answer to that one. He is plain Mr. Scharff now, nothing military in sight anywhere. Molly told me that he had found an apartment up on East 53d Street for Jeanne and himself — maybe not all they might have hoped for, but most acceptable under the circumstances. Our pet, the 1909 Fried Clam Kid, is back and up at the Institute working on his master's degree. Molly told me that he himself had already represented an old client in Pittsburgh in a matter threatening a strike, and the dispute had been amicably settled — good news in these days! Molly agreed with me that what Dr. Compton has been doing is indeed a magnificent piece of work. And this is a good report on the Scharffs, I assure you." Incidentally, the April Review carries the news that Harold F. Ballard, I, has joined the Technology Club of New York and that a number of 'visiting firemen' had dropped in and hung their hats overnight and among them . . . M. J. Scharff, '09. . . .

News comes from Washington, D.C., of the passing of Edwin Hahn, II, President of William Hahn and Company, a shoe firm of Washington and Baltimore. He died at his home, 3319 Cleveland Avenue, on Thursday, February 28. Edwin was born in Washington and was graduated from the McKinley Technical High School there before coming to Technology. Locally and nationally he was prominent in the shoe business and was a former director of the National Shoe Retailers Association. Last year he completed an extensive survey of all phases of the shoe business for the Department of Commerce and was author of many articles on that business. He participated in the war effort, serving on the Small Business Unit of the War Department, at the United Nations Service Center, and on local price and rationing boards. He was a thirty-second degree Mason, a member of Almas Temple, the Nobles of the Mystic Shrine, the Cosmopolitan Club, and the Woodmont Country Club, and a board member of the Police Boys' Club. He is survived by his widow, Mrs. Florentine I.

Hahn; a son, William; two daughters, Mrs. Maurice Bernbaum and Miss Mathilda Hahn. — PAUL M. WISWALL, *Secretary*, 90 Hillside Avenue, Glen Ridge, N.J. CHESTER L. DAWES, *Review Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass. *Assistant Secretaries*: MAURICE R. SCHARFF, 3860 Rodman Street, Northwest, Washington 16, D.C.; GEORGE E. WALLIS, 1606 Hinman Avenue, Evanston, Ill.

1910

The returns for the class reunion this June informed us of Herbert S. Hollingsworth's death on May 2, 1945. Albert J. Beach passed away on March 29. Beach was a past master of the Putnam and a member of the Richard C. McLamen Lodges of Cambridge. Walter Spalding is now out of the Navy and is located in Honolulu.

Members of the Class are maintaining their good record of luncheon meetings every third Tuesday of the month at Whyte's Restaurant on Fulton Street, New York. At the last luncheon these men were present: Hal Arnold, Carroll Benton, Hardy Cook, Fred Dewey, Larry Hemmenway, Stuart Henderson, Gordon Holbrook, Raymond Jacoby, John Lodge, Al Phillips, Ralph Preston, Carroll Shaw, Stuart Sneddon, and Art Stein. Larry Hemmenway gives a general invitation to all 1910 men who may be in New York City on the third Tuesday of the month to attend; telephone Al Phillips at Barclay 7-7067 or Art Stein at Digby 4-1270 for information.

H. E. Beebe, who is now in Los Angeles, writes as follows: "In September, I flew back to South Dakota for the wedding of daughter Beatrice to George Meierstein, who had just returned from field service in northern Africa and in Italy. This was my first visit back to the old home town since beginning aircraft work with Lockheed two years ago. In those two years I did not miss a day for sickness or vacation. The young people left for a honeymoon in the Black Hills and are now settled at the Iowa State College at Ames — the young man finishing a forestry course and Beatrice working in the office of a branch of an atomic bomb research project. During the last 18 months of war work, I was in charge of the materials in a plant making the pilots' enclosures for B-24 bombers, outfitting steel masts for troopships, and making sections of steel ships for Consolidated Steel and anchors for the Maritime Commission, also many special jobs for Cal Tech. The war contracts were pretty well liquidated by August, 1945, and the plant sold out in September, the new company moving in from a smaller building. As they carried on a different line of work and had a complete staff built up in past years, the several hundred employees of Western were all relieved — only six being kept. This fact made me turn to gathering up the two years of loose ends in my own affairs; frankly, at my age I do not expect to see anyone trampled under foot at my door trying to give me a responsible position. I did work with a building company this winter for two months, as my son will be out here by April first and I wished to post myself on building problems — which are numerous.

"The group of Technology Alumni heard Professor Padelford, who stimulated the

meeting into voting to publish an Alumni directory for southern California. I am on the committee, with six other later graduates. The directory should bring many more out to the meetings and serve as a continuous source of information which will lead to co-operation among Technology graduates. We expect the attendance to be doubled at the first meeting after the directory is published — which should be by June first, and hope that President Compton may find an opportunity to be with us. Another hope is to have some room or office of our own where Tech men may always meet and find other Alumni. If I can be of service to any graduates sojourning for a short time in the Los Angeles area, the telephone is Granite 9572 and the address, 1847 North Wilcox Avenue, Zone 28, Hollywood — very near that celebrated 'Hollywood and Vine.' "

John Scarff is now in Europe as a government representative. — HERBERT S. CLEVERDON, *Secretary*, 120 Tremont Street, Boston 8, Mass.

1911

"If they ever stop talking, at the U.N., you'd better start praying for civilization," said our General, George Kenney, II, addressing the Dutch Treat Club in New York shortly after Easter and discussing the A-bomb's potential. Which reminds us that Sellie Seligman, III, sent us a clip from the *Herald Tribune* for April 11 showing George and representatives of four other nations on the United Nations military committee, and his accompanying comment was: "He sure looks as if he hated to get into this one!"

Currently the cinema has another of its many revivals of Owen Wister's *The Virginian*, each time with a new hero, but 1911's "Virginian" believes in keeping the "leading man" role himself. Specifically, on March 30 in Fort Lee, New Jersey, James Kenneth Campbell, I, was married to Nepomocena Antoinette Kwik. The announcement carried a card to show them at home after the first of May at 119 Cottage Avenue, Mount Vernon, N. Y. Jim is a member of the consulting engineering firm of Eadie, Freund and Campbell at 500 Fifth Avenue, New York City.

We learned recently that Stanley M. Burroughs, II, died at his home in Belmont on March 25, 1943. He was with us for a year or so only and had never been active in class or Institute affairs. No details were supplied.

These reunion mailings are productive of a number of interesting facts, hitherto undivulged. For instance, I learned that Chet Pepper, II, Field Secretary for Burdett College, Boston, for a number of years, has for four years been a safety engineer at the Watertown Arsenal, this information accompanying a registration slip for four (self, wife, daughter and son-in-law) at the reunion.

From New Haven, Conn., Wes Jones, II, writes: "After 15 years as Eastern representative for Barco Manufacturing Company, along about reunion time I shall be in the throes of training a successor, pending my transfer to the home office in Chicago; so the chances for my attendance seem to be very slim. It would be a pleasure indeed, however, to renew the friendships made with you, Dennie, and Jack Herlihy,

Harry Waterfall, and the others during my two years at M.I.T. Best wishes for a perfect week end."

Speaking of Jack Herlihy, Harry Tisdale, our reunion scout for the metropolitan area, recently reported having seen Jack at a dinner at the Waldorf. Harry has also reported some business changes: Norm Lougee, VI, for years and years with Stone and Webster, is now with J. H. Manning Company at 120 Broadway, New York City, and continues to live at 39 Homestead Road, Bronxville, N.Y. Bart Nealey, I, for quite some time affiliated with the American Gas Association, is now with the International Business Machines Corporation at 590 Madison Avenue, New York, but continues to live on Hurlbutt Road in Wilton, Conn. Both said they'd have to make last minute decisions on reunion attendance, a condition which applied also, Harry reported, to Liv Ferris, VI, Bill Orchard, XI, and Rufe Zimmerman, IX. He said he had but one "casualty" to report, "and that concerns Joe and Rose Harrington. Their daughter, Mary, is getting married on June 1, and they have to move on June 3. So, while they had every intention of coming, this sudden change in their plans will make it almost impossible." We'll surely miss them — they're a grand couple.

K. W. Dennett, II, and his wife left Honolulu in late April for a trip to the States, which they hoped would result in their being able to get to the reunion. They planned first to visit their oldest son, Robert, recently returned from Guam, where he was in the Army but was growing vegetables for the Federal Emergency Administration, and now back at Cornell University to complete his education in agriculture. Later, they will attend the June graduation of their youngest son, George, from West Point and his subsequent wedding. Dennett is hoping to make a new connection for "somewhere in the Pacific area," and while in the States, he and Mrs. Dennett will make their headquarters with his sister, Mrs. Walter B. Nourse, Casanova, Va.

Ted Van Tassel, X, returned in early April from a seven weeks' trip through the Midwest, visiting shoe factories regarding his new sealed-seam welt process, and said he had had a good telephone talk with Lloyd Cooley, X, while in Chicago. Ted and Helen have moved into their new house on Jerusalem Road, at Linden Drive, Cohasset, and among their early visitors were George and Renée Forristall, who expect to occupy their new home in Wellesley soon. George, you know, is with the Harry M. Frost Company, advertising, at 260 Tremont Street, Boston.

Well, mates, the reunion will be history by the time these notes appear, but there'll be a big issue of *The Evident* out by late June or early October, with Jim Duffy, VI, and Carl Richmond, I, as keepers of the log. Watch for it! In the meantime don't forget Alumni Fund VII, please. — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Gardner, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

1913

Collections for the 1946-1947 Alumni Fund have begun, and I hope that we can

improve on our last year's showing. The cause is worthy, and remember that out of the amount of your check, about five dollars is taken for expenses and your subscription to *The Review*. So this year please add five dollars on this account, if you haven't taken it into consideration. Larry Hart, I, Class Agent for the Fund, needs your co-operation particularly this year for he is busy, as you will see by the following quotation entitled "The Velvet Glove" taken from the February *Building Reporter*: "Tall, dark but graying, handsome front-man for the Producers' Council (in turn the United Front for materials suppliers and the construction industry) in 1945-46 is lean, saturnine, 55-year-old (he looks 42) Laurence C. (Larry) Hart, who outwardly resembles the cinema's Walter Pidgeon, inwardly resents it. Vice-President of the Johns-Manville Sales Corporation since 1940, Hart occupies a Williamsburg blue & black *Transite*-walled office on the sixth floor of the J-M building. Here, with a sort of industrial loyalty, walls, ceiling, floors — even windowsills — are finished in J-M manufactured materials. Long curtains keep outsiders from looking in, Hart from looking out.

"Born in Dayton, Ohio, Hart completed primary and secondary school there, there too, met his wife Bernice Van Allen (1906). When he finished high school (1909) she gave him a 3/8-inch-wide gold ring, installed it on his finger, sent him off to MIT. Four years later he got his B.Sc. in Civil and Sanitary Engineering, came back, married her. The ring was still there; still is today. On July 6, 1914, he joined Johns-Manville, largest single U. S. building materials producer as an acoustical engineer. (While at M.I.T. he had become interested in Dr. Wallace Sabine's researches into confined sound.) Shortly before Hart entered the company Sabine became company consultant, supervised organization of J-M's Architectural Acoustical Service. Hart was thus a pioneer in a new science which at that time used sound-absorbing hair-felt to meet acoustical problems. He left the Acoustical Service in 1918, after transfer to Chicago as Division Sales Manager, developed mobile habits. Today he is seldom in one city very long, spends much of his time making one-night stands all over the country. By 1935 he had become General Sales Manager of the Building Materials Department of J-M, in 1940 was elected vice-president of the Johns-Manville Corporation, today supervises sales in 17 districts comprising the U. S., Canada and Hawaii and some 325 territorial salesmen.

"Today the acoustical tile ceilings of his N.Y. office see less and less of his activities. Much of his time is taken up with frantic, portfolio-toting train trips from Washington to St. Louis, to New Orleans, to the Coast — and back again. In his journeyings he travels largely by train, uses planes only when necessary. But behind the solid, panelless wood of the office door his personal belongings wait. Here leather-framed photos of his wife, son, daughter-in-law, daughter, son-in-law, grandson occupy window sills, table surfaces. (Hart has a penchant for keeping things on windowsills: a blue-bound library which came as part of the office decor rests on the dark-wood table; but a stack of trade journals,

business magazines, catalogues are half-concealed behind the long window drapes.) A lacquered water-carafe — to match the walls — stands on a small table by his desk. Leather-covered desk fixtures, letter files, blotter-pads, stand on the all-but-empty surface of the mahogany desk. But all these, like the dark, formal suit he wears, the gold watch-chain draped across his vest, the horn-rimmed reading glasses he seldom uses, reflect none of his personality.

"More typical . . . are the rough-leather portfolio, lettered in gold 'L. C. H.,' the little pile of nervous cigarette butts in the ash-tray (Hart smokes rapidly and often, sometimes cigars.) He talks firmly, in a deep, rich voice. His articulation and pronunciation are nearly perfect. Questions get an immediate, accurate answer, without fumbling for words. But his conversations are cautious. Talking with Hart is something of a verbal fencing-match. His approach to business is completely humorless, guarded and reserved. He dexterously avoids controversial issues, talks freely about personal matters.

"His biggest interest, outside of his family and matters connected with J-M, is the Producers' Council. He was elected a Director of PC in 1943 after his appointment to the Council by Johns-Manville to succeed F. P. Byington. Later he served a short term as 1st vice-president, and in April, '45, was elected to head the Council. 24-year-old PC is made up of some 76 manufacturers of building materials, twenty material associations. Originally formed as an affiliate of the American Institute of Architects it has more recently, according to Hart: ' . . . broadened its activities for the study of dimensional coordination, of the use of materials in combination, and to encourage improvement of building codes. It has also developed a public and government relations program in the interest of industry and to improve the "climate" for postwar operations of the construction industry. Under the endorsement of the U. S. Chamber of Commerce we have organized the Construction Industry Advisory Council, which functions for the building industry and the materials suppliers as does the AIA for architects.' For the Council Hart is constantly on the move. His time is closely scheduled, allowing so many minutes for this; so many for that.

"During a recent interview, an associate entered, reported an important visitor outside. Said Hart: 'Shall I shake hands with him now or have a chat with him in half an hour?' Hart is, in his own words: ' . . . steeped in dryfly fishing,' frantically pursues trout & salmon from Maine to Nova Scotia (he prefers the Kennebecago). Once a regular subscriber to the Metropolitan Opera and the N. Y. Philharmonic, he now listens regularly by radio at home (and so does the rest of his family). Essentially a romantic, he leans heavily toward Wagner ('The Ring,' 'Tristan'), Beethoven, Tchaikowsky; admires Gershwin as a 'modern.' He normally reads historical novels, autobiography.

"Once a tennis, basketball and indoor baseball player, Hart looks physically in good tune, lately gets more exercise from walking. 'My manual dexterity is nil. I can't even tie my own dry flies.' He is a

member of the Red Cross Blood Donors 'One-Gallon Club,' wears the button and ribbon in his lapel. He takes an active part in the J-M Quarter Century Club and is now president of the New York Chapter. He is vice-chairman of the NAM's Home and Industry Committee (which handles public relations). Hart lives in Bronxville, commutes (by train) to Manhattan, particularly resents co-commuters who spread their newspapers in his face or (from the seat behind) push his hat down over his eyes with their papers." Currently, late April, Larry, as Producers' Council President, is supporting the new House measure concerning the Office of Price Administration, which he says "would enable producers of building materials to expand their output of low-cost materials which now are being produced in limited quantities because existing price ceilings do not permit a profit."

Dave Nason, XIV, always writes with wit and a punch. Read carefully his argument for giving to the Alumni Fund: "A few days ago, with the thermometer under zero, I saw an unusual sight on Wisconsin Avenue. Several hundred people standing in line and shivering, all of them waiting to get into a popular store to get a pair of nylons. Still having some power of observation, I took a good look. You never saw such legs, bandy, bowlegged, skinny, pimply and just poles. What they needed was shin guards not stockings. Their general appearance otherwise was on the low side of motley, a few men but mostly women, a few negroes but mostly soiled white, some professional buyers for the black market but largely a fair average cut of the New Deal America. And they all vote. And the Office of Price Administration will not let them make stockings or automobiles or steel or what have you because they have forgotten or never knew that the law of supply and demand is regulated by a price tag."

"More seriously, I hope that our Class will at least meet its minimum obligations to the Alumni Fund. It is a cheap yet excellent investment for the donor that Technology may have the sinews to maintain its prestige and also an obligation that each of us owes for the advantages which have accrued to us over the years. You cannot expect those who stand in line waiting for nylons to give, as they lack a sense of proportion as to what is important. Out of every check to the Alumni Fund, 50 per cent more or less is tax money, and I ask you whether Technology will use your contribution as wisely as the politicians. Either you give it to Tech or to the tax collector. You don't keep it. Why not contribute a little more generously to the general fund that is devoted to the production of better citizens, to the end that possibly what we do save from this economic debacle may buy us more merchandise? The only one of your suggested questions that begs for an answer at the moment is that one about my whatnot. My whatnot is getting very low on good bourbon. If any classmate has an excess of good eight-to-ten-year-old bonded, I implore his charity. I am not in a buying mood. And I hope you are well and prosperous, Freddy Boy; with an adequate ceiling, no black competition, and complacent, efficient labor conditions."

The following about Nat Sage's son appeared on February 8, in the New Bedford Times: "Miss Catharine Bergen Woodson, daughter of Mrs. James Dexter Woodson of Portsmouth, N.H., and the late Mr. Woodson, became the bride . . . of Nathaniel McL. Sage, Jr., son of Mr. and Mrs. Nathaniel McL. Sage of Brookline. The Rev. William W. Lewis performed the ceremony in the parsonage of the Unitarian Church, Portsmouth. Mrs. Sage attended Wellesley College and was graduated from the University of New Mexico in 1943. Mr. Sage, a member of Delta Psi and the St. Anthony Club of New York, was graduated from Pomfret School in 1936 and from . . . Technology in 1941. Formerly a captain in the Army, he served in Iceland, France and Germany and is now returning to M.I.T. to do graduate work."

Now for a succession of interesting notes and letters to the Class Secretary. Dr. Louisa M. Norton, who was Effie MacDonald, VIII: "I was sorry not to see you at the Alumni Dinner. I am enclosing a dollar for class dues. I don't know whether I have told you before, but I am a grandmother now. My daughter Ida married Walter L. Milne, who has just been discharged from the Navy, and they have a son, Richard Norton Milne, born last September. My other daughter, Dorothy, married Thomas E. Moye, a minister. As for myself, I am busy, as I am the pathologist at four hospitals at Portsmouth, Exeter, Wolfeboro, and Rochester, N.H., where I have my headquarters. I drive between 300 and 500 miles a month, and in addition to my regular hospital work and managing a house, do considerable public speaking along health lines. During the war, I managed three blood banks. There is always something doing in my work, and I have a full, busy life. It was nice to see so many of the Class at the dinner."

Allen Spicer, X: "As your records would show, I'm one of the men who was with you at Technology only a short time. When I was in Cleveland years ago, I was closely associated with many Tech men — Arthur T. Hopkins '97, Charles Rowley '12, Arch Eicher '12, and Don Stevens '11, and in those years I was naturally more heedful of my obligations to the Class — thoughtful enough to 'adopt' me. I am going to be no longer heedless. My apologies — and my dues." — Fay Williams, II, of Providence is all wrong, but he wrote: "Sorry, but I do not believe the problems, worries, travels, diversions, and what not of a Factory Mutual man would be of interest to the rest of 1913."

Jack Farwell, II: "Relative to reviving correspondence with the Class Secretary, your outline of a specification was perfect and certainly covered life, namely — family, problems, worries, achievements, travels, diversions, and so on. These words reminded me of so many different things, I thought it best not to make an attempt. I have no family, being still a bachelor. I don't see why you followed the word 'family' with 'problems' and 'worries'; but of course I am not qualified to judge. Also, there are so many problems and worries in general, why burden your readers with such items? but still, on the other hand, maybe that's a good idea. My congratulations, anyway, on suggesting the subjects for correspondence. I see some Tech men

occasionally; and again I am making a bold attempt to be present at the June convention and to supplement my sole attendance on record, I am sad to say — at the 25th reunion."

Holland Wemple, X: "The Secretary says that all class notes have dried up, and this is what I notice in looking over The Review. As for myself, I have joined the great group of vice-presidents, having been elected to that position about a year ago by the board of directors of the Texas Gulf Sulphur Company. Our company was one of the few that supplied an essential material, which was not under allocation during the war. Although we were busy, we were able to fill demands for the sulphur program both in this country and abroad. I see our old classmates, Larry Hart and C. A. Crawford, from time to time."

Henry Glidden, IV, makes up for his long silence: "I was very glad to get your note and am enclosing check for a dollar. I will scribble a few lines as requested. First, family: My two daughters are both married, and I'm three times a grandpop. Dorothy, the elder, married a lawyer in New York City. He was in the uniform of the Red Cross during the war. They live in South Norwalk, Conn., and have a son and daughter. Frances married a lad who went into the Army right out of school. He was a lieutenant in the K-9 division of the Quartermaster Corps. After months of training dogs in this country, he took a small outfit to New Guinea and spent about a year and a half doing reconnaissance work between the Allied and enemy lines with the dogs. The proof of the efficiency of the dogs' work is that every man and dog came back whole; whereas, without dogs, the expected casualty is about 50 per cent per mission, I'm told! Now he is out, and trying to get established. They lived all over the country at Army Camp towns after he came back from the Pacific — even in Beverly Hills, while he served as technical adviser to a motion picture outfit, representing the Army, during the making of a picture showing war dogs in action. They have a wee daughter now and hope to get settled down for a while."

"Back in 1940, things were getting blacker and blacker for the architects here. Allen and Collens' work dried up almost completely, and so I cast around for more fertile fields. The Turner Construction Company was building a large structure right across the street for New England Mutual Life Insurance Company. I had several contracts there and so managed to make a connection. It has proven to be the best break I have ever had. After the New England Mutual work was completed, I went out in the field on a number of war jobs. There were three plants for Pratt and Whitney Aircraft Company, at Willimantic, Conn., East Longmeadow, Mass., and Southington, Conn. For a while I was engineer on the Willimantic job, then was transferred to the 'control office,' the central field office for these three jobs, at East Longmeadow, as assistant purchasing agent. Then they sent me to East Hartford as field office engineer on the wind tunnel for Pratt and Whitney. That was a most interesting task — a concrete wind tunnel. The forms were quite a problem. I was working with the Boston Office engineer. All the forms were detailed in the field and

built on 40-foot-square platforms. Great accuracy had to be maintained, and extreme stiffness in the forms to support the liquid concrete without its deforming. The inspecting engineers went over the whole thing with a surveying instrument after completion and found it out not more than a quarter inch anywhere! Considering the fact that it is nearly 650 feet long with four right angles, and a maximum size of about 35 feet inside, the percentage of error is reasonably small.

"Since then I have been in and out of Boston, several months at Scovill Manufacturing Company in Waterbury, putting in some huge machine foundations, and at Stanley Works in New Britain, making a survey of part of their property. On that site we are now building two new factory buildings for Stanley Works. This is very different from handling the architectural end of Gothic churches, college libraries, and such, but equally interesting in another way. Now and again there is even architectural work to do, and my Massachusetts registration then comes in very handy. If you are in Boston, do look me up for lunch. The telephone is Commonwealth 4400, and the address, 38 Newbury Street."

Phil Burt, VI: "Sorry I have been so lax about sending you the dollar. I wrote out the check some two months ago, but it has been on my desk ever since, as I have been waiting until I could write a line or two with it. I have no exciting news to report about myself. I am purchasing agent at Wellesley College, live next door in Needham, and my daughter, after two years in the SPARS, is living in Coral Gables, Fla. I don't see many 1913 men but at a Stein-on-the-Table Banquet in at the Statler a few weeks ago, I enjoyed meeting the small group that was there. I have not taken in these Boston meetings as I should have but have resolved that in the future I am not going to miss a one. Funny, how a guy gets sort of sentimental after he passes 50 and yearns to recapture his youth!"

Clarence Berry, VI: "I am still in the lighting game, and at present am the illuminating engineer of the Consolidated Gas Electric Light and Power Company of Baltimore. We are gradually building up our department as the men are released from service. Last week I was in Philadelphia and presented a paper on 'Office Lighting Practice' before the regional conference of the Illuminating Engineering Society. My one big hobby is boating. Last year I was elected commander of the Annapolis Power Squadron, a unit of the United States Power Squadron. I have taken all the courses of instruction, including navigation, which gives me an 'N' rating. Also, I sport three stars, which denote 'N,' on the bow of my Matthews cruiser."

Stanley Davis, VI: "Here is a little bit to help prime your 'dried-up' correspondence. I am now grandpa of a five-months old baby girl — Mina Ann. And what a baby! When you have her to play with, you can solve more 'problems' with less 'worry' and you don't need to 'travel' for 'diversion.'" — Sam Knight, VI, from Winkelman, Ariz.: "Nothing new. I am still mining copper by the Grace of God and the indulgence of the A.F. of L., and waiting for the 1946 trout season." I believe Sam knows how to enjoy life.

Bill Brewster, II: "I am enclosing the dollar for the class dues and also responding to your request for information — what do you think of that? I am still on the same job, which keeps me pretty busy, what with difficulties in the supply of fiber in addition to all the usual worries. Before the war, we got about 60 per cent of our raw material from the Philippines and the Dutch East Indies, and only now is a trickle beginning to flow out of the Philippines. We got through the war some way by the use of funny fibers, and one would think that, with the war over, we should be in a more comfortable position. The rehabilitated areas have to be looked out for, however, and that is making our fiber supply picture as difficult as at any time.

"I don't know whether I told you that I went to England and Germany this past summer. I went to England on business for the company and when in England became a member of the armed forces with the assimilated grade of colonel, which pleased me as it outranked all my kids. I was in and out of the Army in eight days and a colonel (so-called) in the meantime, which, you see, puts me way ahead of the 90-day wonders. My mission in all this was undertaken as a member of the Technical Industrial Intelligence Committee: I went to Germany to see what the Germans had done in the way of rope and twine during the war. Fortunately, all my children came through in good shape; only one of them went overseas, and that was my oldest boy, who was a major in the Ordnance and was in Chungking for about two years. My next son and my son-in-law were fliers and captains in the Air Forces and did a good deal of helicopter work. My youngest boy is just being graduated from the Marine Corps Reserve training course at Dartmouth and receives his reserve commission, I think, as he gets out.

"You ask about diversions: those seem to have been somewhat missing in the past few years, as you are probably aware, but no doubt there'll come a day when such things can again be thought of. I have very much enjoyed the two meetings of the Corporation at M.I.T. which I have attended. I am impressed by the caliber of the members of the Corporation, of course, and the way business is conducted, as well as coming away with a feeling that the Institute is in good shape and never had a better opportunity, and I think we may expect that it will be fully grasped." — FREDERICK D. MURDOCK, *Secretary*, Murdock Webbing Company, Box 788, Pawtucket, R.I.

1914

You should have received by this time a letter from Ross Dickson, detailing the Alumni Fund for 1945. We may be proud that we were able to reach the quota both in dollars and in numbers. These quotas were very carefully set when the Alumni Fund was set up. They were not unreasonable, but the genuine interest of a class in Technology is reflected when they are met. The breakdown by courses was particularly interesting. Like all statistics, it really needs explanation, but nevertheless the facts speak out eloquently. As Ross spends many evenings throughout the year handling the Alumni Fund for 1914, let us all

make it as easy as possible for him and contribute early and generously.

Ros Barratt, a Navy commander, is back in his architectural office at 10 West 33d Street, New York City, after serving most of the war in Norfolk, Va., as a weather officer for the Fifth Naval District. At the suggestion of Charlie Fiske, Ros has written a very interesting letter on the significance of precise weather prediction, covering the submarine patrol, which was interested in the weather from Labrador to Coco Solo. The differences in weather forecast at varying altitudes are of tremendous importance to patrolling pilots. It is often a matter of life or death with these pilots, who, Ros says, are often more enthusiastic than they are weather-wise. Off the record, we understand that Ros had one of the best weather-predicting records of any district. In fact, his work was quite the envy of some of the others. Perhaps that course in precision of measurements that bothered us back in our sophomore year had something to do with Ros's good record.

A few months ago Tom Duffield's New York address was given in these notes with the comment that Tom would unquestionably like to receive a card or a note from any 1914 man, as he was confined to his bed. Tom has now been moved to Asbury Park, N.J., where his address is 1105 Grand Avenue. Your Secretary is very sorry to report that it looks as if Tom would be confined for some little time yet. Why not drop him a note?

That house that Colonel Lucian Burnham bought in Pasadena continues to keep your Secretary mixed up. You will recall that recently your Secretary said that Burnham was there, only to find he was out in the Pacific. He is now back in the United States, but is he in that house? No. He is stationed at Camp Lejeune, North Carolina. Burnham writes that the camp has been greatly changed since he was there under canvas in the winter of 1941. It has now been developed into a modern, up-to-date military post.

Bob MacCart, who has spent most of his years since graduation as a naval officer and retired a while back, has settled in Stamford, Conn., where he has purchased a controlling interest in the Brown Brothers Foundry, Inc. They specialize in non-ferrous castings but also do electroplating and associated work. Bob would like to see any classmates who may be passing through Stamford.

Phil Morrill, who has spent most of his time since graduation in St. Louis and whose official position is that of vice-president of the Bemis Brothers Bag Company, has been spending considerable time recently in Cannelton, Ind. His company has purchased the Strongwall Mills there and incorporated them into the Bemis system. Phil writes that the Strongwall Mills are quite an M.I.T. venture, as three out of the four corporate officers are Technology men.

Walt Keith found time to leave his rubber business in Akron, Ohio, to get a little vacation at Lake Worth, Fla., this year. Now that the war is over, perhaps more of us will have an opportunity to enjoy a little winter sunshine in Florida. Your Secretary expects a loud yowl to arise from the very loyal group from 1914 in Southern California. The April issue of

Electronics had an interesting article on the Navy JP Sonar system, developed for submarine detection. Credit was given to J. W. Horton as one of the principals responsible for the development of this effective piece of equipment.

Those attending our 30th reunion will recall the very interesting talk on China given by Frank T. Yeh, a captain in the Chinese Navy. At the time, he was with the Chinese Naval Construction Mission in Washington and came up to the reunion with Admiral Richey. Yeh has now returned to Shanghai, China. As he has been a frequent visitor to the United States since being graduated from the Institute and at one time was stationed at the Fore River, Mass., shipyard, perhaps we can look forward to a return trip enabling him to be with us at our 35th reunion. Incidentally, Charlie Fiske and your Secretary have been doing a little scouting as to a suitable place to hold our 35th.

Frank Ahern was in Boston recently for the sad duty of attending his brother's funeral. Frank is still with the Department of the Interior, Washington, but on a new assignment. He is now the division safety engineer. Frank says his new position rates a carpet, and those who have occasion to be in Washington know that means he is the equivalent of a flag officer in the armed services. In other words, Frank has joined the Brass Hats. — H. B. RICHMOND, *Secretary*, General Radio Company, 275 Massachusetts Avenue, Cambridge 39, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York 19, N.Y.

1915

Are you coming to our Victory Reunion at the Cape Codder Hotel, Falmouth (on the Cape) Mass., June 13, 14, 15, and 16? This is your last chance to sign up. Wire me at once. It's going to be a great time together. With interest in the reunion, classmates have written some fine letters.

Bill Spencer, 213 Cedarcroft Road, Baltimore 12, Md., writes thus: "I am sending a booklet which is the publication of the Engineers Club of Baltimore. I have been presiding officer of this club for the past year and expect to turn over my duties to a successor early in June, in time for me to get away for our 30th reunion . . . I hope. We have more than 830 members, mostly engineers and men interested in science; and we are the nucleus for the national engineering and scientific organizations such as the American Society of Civil Engineers, the American Society of Mechanical Engineers, and others, 17 of which are affiliated with us. . . . The war is over, but the construction industry is left with many headaches and much confusion by the politicians in Washington, who have their eyes only on votes. . . . I shall be glad to do whatever I can to help you with your task for June, but I know that at this distance you cannot expect much real assistance. . . . With my very sincere regards to all the fellows!"

We hate to miss Charlie Williams, but it's hard to beat such a high priority: "I'm sorry I had to send you my post card with a 'no' for the reunion. June 15 is Hope's and my 25th wedding anniversary, and that rates AAAAAAA plus priority. I don't know whether you spoke

of dates at the New York dinner but, in any case, they didn't sink in until I saw them in your letter. As a carefree old bachelor, you may not understand, but honestly, this is about the only thing that could possibly keep me away. Have a swell time and don't keep sober. . . . We had a grand time in Florida. Now we're back, and I'm looking for that ideal job." — Even with all he's done for the Class in the past, the old redheaded Pirate Rooney is looking forward to more generosity: "It's a pleasure to make this slight donation to 1915; I wish it could be more. But you wait until the new Rooney Company makes that 'first million' and we'll show you." All the best to George in his new work.

Ken and Esther Johnson, 2 Beech Drive, Norwich, Conn., have left home for a little vacation at Hot Springs. Ken's on my personal follow-up list, so I hope to have him at the reunion. — Jim D. McIntyre, War Department, Office of the Chief of Staff, Washington, D.C., very frankly writes: "I am now a brigadier general on the General Staff and was a resident of a 'Pentagon foxhole' during all the shooting. As a result, I can't complain about the Army food, clothes, or shelter, and when a soldier can't gripe, something is wrong. In my case, I think it's old age; so I am going to retire in about 90 days and go back to Alabama, where I can work up a good gripe and cuss out the whole world."

When Mrs. Holway writes, you know it's not only for Bill but also to show her own interest in 1915. May there be many more such class wives. Ladies, don't be afraid to write me about yourselves, your husbands, your families. Bill lives at 302 East 18th Street, Tulsa 5, Okla., and his business is W. R. Holway and Associates in Tulsa. Mrs. Holway writes: "It is hopeless to ask William R. Holway to write the newsletter you asked for, so I will make an attempt. We are still in the consulting business in Tulsa, and now the four partners are together after the separation of the war years: W. R. Holway, Frances H. Holway (the writer), D. K. Holway (the electrical engineer) and William N. Holway, up to March 1 a lieutenant in the Navy, stationed at the San Pedro Dry Docks in the Planning Division. He was also graduated from Technology in Civil and Sanitary Engineering in February, 1943, and has served in the Navy ever since. This is one family partnership we think the revenue service will pass, since all four partners are very active in the business. . . . We are in the throes of getting our preliminary plans and Community Facilities applications for many water, sewer, and power projects for cities and towns in Oklahoma, and are still consulting engineers to the Southwestern Power Administration on the Pensacola project, which is still building transmission lines and substations and just completing the installation of a fifth generating unit in the power house. The senior partner is also consulting engineer for the Grand River Dam Authority, the state agency which is making plans to take back the Grand River project from the Federal Government sometime this year. . . . During the war about 45 of our employees saw service all over the world. Now the lieutenant colonels and majors and captains are returning, and we

are using as many as possible and hoping for enough work to use all who wish to return to our ranks. It looks now, however, as if there may be so much delay in reconstruction that we shall find it difficult to keep all busy. . . . Best regards to you and admiration for the efficient service you are giving the Class of 1915."

Charles B. Malone, Jr., Roxbury Road, Stamford, Conn., is busy in several new enterprises. We shall give you more about him later. — On a beautiful letterhead, picturesquely representative of his work, Harry J. Murphy, Massachusetts Engineering Company, 15 Fayette Street, North Quincy, Mass., boldly speaks out, as no doubt many of you feel: "Yours is one of the touches which gives me pleasure. It is truly gratifying to 'help Azel'. . . . At present, I am being squeezed by Mr. Phil Murray, who sends no steel. Later, I expect the same from Mr. Chester Bowles, for whom we are to make tanks and sell them for cost less 10 per cent!" — Dr. Ralph W. Mendelson, 1016 Parkland Place, Albuquerque, N.M., back from the wars: "I am just getting started in practice after three and a half years of military service. I have plenty of work, but no office space."

Fred J. Vogel, 715 North Linden Street, Oak Park, Ill., says: "I saw Alger, De Beech, and Dana at the American Institute of Electrical Engineers convention. Other than that I am still teaching school, there isn't much to say. I will try to be at the reunion." — Newell L. Foster, 45 Garden Road, Lowell, Mass., the popular insurance man and three-cushion billiard player, pens: "This is not a letter, because I live too close to Boston and therefore should have seen you sooner. I do want to tell you how much I enjoy your class notes and what a wonderful spark plug you are. How are you, and why haven't you been up to Lowell to see me? Best of luck, and here is my little help." — That Everett S. Coldwell, 8 Brooklands, Bronxville 8, N.Y., is in again with his usual crack about my dues letter to those "technically known as the sucker list." But he sent his check; so thanks, Jerry, for falling for my line.

Along with a few others, Whit Brown, Concord, Mass., dropped into my apartment on the way to the Boston Alumni Dinner in February. You've guessed it! His reference is to the time the same gang left here upon their return *after* the dinner (names on request): "I hope the boys got home all right (Sunday morning!). Thanks to your efforts, we had a most enjoyable time Saturday afternoon; I want you to know that it was appreciated by yours truly. . . . I was also much pleased with the progress on reunion plans for June — more power to you. I hope the enclosed check will 'help Azel' a little!" — We'll all miss Alton Cook, 63 Adams Place, Glen Ridge, N.J.: "A complication has arisen which will make it impossible for me to attend the Victory Reunion. My daughter's wedding day has been set for the 15th of June, and I have been informed that my presence at this event is quite essential. So the reunion, even our postponed 30th reunion, is 'out' for me. I am certainly disappointed, for I had been looking forward to this get-together, but fate has ruled otherwise."

Fiske Jones, Post Office Box 482, Fitchburg, Mass., sounds as if he were getting

ready to retire: "I'm taking a little vacation after three strenuous years of war work with the United Aircraft Corporation, for whom I set up and operated a propeller factory in Pawtucket, R.I. . . . Getting ready for spring planting on my farm in Lunenburg, Mass., is a splendid change from three shifts, inspectors, black-outs, and labor problems." — Lloyd Chellman, 1954 Columbia Road, Northwest, Washington, D.C., is a bit conscience-stricken, but his wife's recent fine letter saves him: "I admit my laxity in writing, but my nice wife wrote you a month or so ago about the Chell family." — I talked to Alfred Hall, 19 Locke Street, Saco, Maine, and although he has been laid up for some time, he bravely and loyally hopes to get to the reunion. — Elbridge Casselman, 512 Roslyn Place, Pittsburgh, Pa., telephoned me while visiting his son (M.I.T., 1940) in Newton, Mass., and plans to be at the Cape Codder for the reunion.

Phil Alger, 1758 Wendell Avenue, Schenectady, N.Y., has sent me a book of his late wife's poems, *Romany Rhymes and Domestic Ditties*, and they contain many amusing bits, illustrated with pictures of Phil and his family. I'm proud to have it. — Herb Anderson, Winding Brook, Prospectville, Pa., will, of course, be at the reunion. "Last fall," he says, "I sold my complete stock interest in the Fidelity Machine Company to a holding corporation, expecting to retire and do many things I have not had time for in the past. Now complete new ownership has taken possession, and although this ownership has an executive vice-president, I have agreed to stay on, with a sort of courtesy title of president, at least for another year. I shall be thinking of you in Bermuda next week." One of the textile trade papers had a big write-up with a splendid picture of Herb, describing him thus: "H. W. Anderson is internationally known in the hosiery and knitting industries. He is former chairman of the Knitted Fabric Group of the Underwear Institute, First Associate Member of the Southern Hosiery Manufacturers' Association, aide-de-camp on the staff of the former Governor Ruby Lafoon of Kentucky, President of the Technology Club of Philadelphia, and Honorary Secretary of the Massachusetts Institute of Technology."

It is a sorrowful task to report the passing of our popular and well-known classmate, Reginald T. Friebus, who died at Red Bank, N.J., on March 30. Ted had been Navy representative at Red Bank for the standards agency of the Signal Corps in the Fort Monmouth area. Mrs. Friebus wrote that up until the time he was stricken he had planned to be at our reunion. We'll all miss Red and send our sympathy to his family.

Let's make it a real Victory Reunion. Each and every 1915 man should make a very special effort to be at the Cape Codder. And don't forget to pay your Class Dues and "help Azel." — AZEL W. MACK, Secretary, 40 St. Paul Street, Brookline 46, Mass.

1916

Classmates should observe the new dates for our class reunion at East Bay Lodge, Osterville (Cape Cod), Mass., which are June 14, 15, and 16. As these notes go to press, there are 62 acceptances.

Steve Brophy has furnished the following excerpt from a communication he has received from M. B. Sanders now in France: "I have been in France since 1932 and am returning next week on the *Ile de Groix*. I've been at home since last July recuperating from the effects of the German occupation of Paris and of four months in concentration camp." His address is: 9 bis rue de Rouvray, Neuilly-sur-Seine, France.

Dr. Paul Duff, who plans to attend our reunion, writes that he expects to collect another prize for the largest number of children in any 1916 family. He had nine children at our last reunion; he now has 10 children, and he expects another bottle of whiskey as a prize. — JAMES A. BURBANK, Secretary, The Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, Assistant Secretary, Berke-Moore Company, Inc., 11 Boylston Street, Brookline 46, Mass.

1917

From the annual report of the General Aniline and Film Corporation it appears that Win McNeill is vice-president and controller of that corporation. And speaking of Win, please send him any suggestions you may have in connection with our 30th reunion. It will be remembered that at the Alumni Dinner in Boston in February, Win was elected chairman of our reunion committee and that Henry Strout was elected associate chairman for the Boston area.

Professor Locke '96 has kindly sent us the following memorandum: "Phil Rowe wrote in February en route to India on the S.S. *Wacosta*, when the ship was in the Bay of Bengal. He and Mrs. Rowe expected to arrive in Calcutta on February 5. In May, 1942, as a war measure, the government became the sole importer of shellac, and in July of that year Phil was requested to serve in Washington, first with the Defense Supplies Corporation, and later jointly with them and the War Production Board. The result of his activities was the accumulated government stock pile, which has since been liquidated and, incidentally, at a profit. In October, 1944, when private imports of shellac were again permitted, Phil picked up the threads of his business where he had left off in 1942. He also continued to liquidate government stock. With that job completed, however, he decided that he should get out to India for a brief visit and sew the patient up with the remaining thread. Hence, the present expedition."

Arthur S. Bedell, VII, associate sanitary engineer with the New York state health department's division of sanitation since May, 1925, died suddenly at his home in Delmar, N.Y., on March 30. Bedell had been a student at Dartmouth College before coming to the Institute. For some years he was professor of mathematics and registrar at Robert College, Istanbul, Turkey, and subsequently he became associated with the Utah state department of health, before joining the New York department in 1925. He was a charter member of the New York State Sewage Works Association and had served as its secretary-treasurer since its founding 20 years ago. He was also a member of the American Public Health Association. Surviving are his widow, Mrs. Elsie Bedell, and two daughters, Mrs.

Stanley Hummel and Mrs. James McGraw, both of Albany, N.Y. — RAYMOND STEVENS, Secretary, 30 Memorial Drive, Cambridge 42, Mass. PHILIP E. HULBURD, Assistant Secretary, Philips Exeter Academy, Exeter, N.H.

1918

Any chronicle of mankind, such as class notes, inevitably includes its paragraphs of triumph and its record of the ultimate finality we call death. Thus from Westfield, Mass., comes word via W. W. Rausch '17 of Anchorage Homes, Inc., that Frank R. Creedon of our Class did a superlative job as top man of ordnance construction for the Army. Apparently what he did in building T.N.T. plants, arsenals, and shell-loading plants is something to blow (but not blow up) about. Bill Jeffers immediately drafted him as an assistant in charge of rubber plant construction, the chaos in which he quickly transformed to completed plants. When the construction of Oak Ridge was going sour, the Army stepped Frank in as works manager and the verdict "behind schedule" was changed to "completed ahead of schedule." In each of his achievements, he did the job with hard-hitting, skeleton organizations, numbered in tens instead of the usual Washington thousands, with economy and speed, and without bungling or red tape. On March 4, Frank was decorated by President Truman with the Medal of Merit, the government's highest civilian award. Two weeks ago he took office as director of War Assets Corporation in charge of Capital Goods Disposal. Again, he will do his job with the usual practical results.

Thus from Washington comes the news that Bill Foster also received the Medal of Merit, for his services in the wartime purchasing program of the War Department, at a ceremony in the Pentagon on March 13. During the war, Bill served as director of the purchases division and as assistant director of materiel, Army Service Forces, and as the special representative of the Under Secretary of War. He was responsible for policies on placement of contracts and negotiation of prices for all purchases of the War Department and approved personally all procurement contracts for more than five million dollars. The Government has awarded only 97 Medals of Merit to date. The complete citation reads as follows: "William C. Foster, for exceptionally meritorious and distinguished service to the War Department in the performance of duties which contributed materially to the success of the war effort. Through his deep understanding and unusual ability, many of the more important procurement problems were solved. In his responsibility for the policy and procedure for pricing war contracts, he, perhaps more than any other one man, was responsible for savings to the Government that totaled many billions of dollars. His ability to handle a constant flow of complex, difficult, and important assignments pertinent to the purchases division of Headquarters, A.S.F., resulted in the smooth and effective functioning of that division, on whom the responsibility for procurement for the greatest armies in history rested. Because of his sound judgment, extraordinary tact, and forthrightness in dealing with contractors, despite efforts to obtain the closest prices,

he not only gained for the War Department their good will and co-operation, but increased production efforts, which resulted in conserving critical labor and material. With unusual consciousness of his responsibility and devotion to duty he contributed unstintingly of himself to the prosecution of the war. His accomplishments, which reflected great credit to the War Department and himself, were unusually numerous and valuable."

Thus, also, from Kansas City comes word of the death on March 12 of Clarence S. Timanus, waterworks engineer member of the firm of Burns and McDonnell. Says the *Kansas City Star*: "He helped design the water-softening plant in Kansas City and the water pumping station of Kansas City, Kansas. He joined the engineering firm in 1918, while still in the naval aviation service. In 1924 he was made an associate engineer and in 1930 was made a member of the firm. He designed the major part of the water purification system in Cincinnati in 1937 and the water supply system in Springfield, Ill., in 1934. Since he had been with Burns and McDonnell, he had handled more than 200 water supply and treatment plants."

Hall Nichols, who was graduated from Harvard and then got a degree in Civil Engineering with our Class two years later, has been running for the Park Commission in Wellesley. He has been president of the Wellesley Community Council. He has served as executive secretary and chief engineer of the Massachusetts Emergency Public Works Commission and is now actively engaged in developing a postwar building program. He has served as a town meeting member and was chairman of the Greater Boston Community Chest drive in 1942. He has also been a member of the board of trustees of the Wellesley-Newton Hospital and at present is president of the Wellesley Community Council.

Anyone having a 1940 or a 1941 stein from the Alumni banquets of those years and wishing to exchange same for a reasonable amount of coin of the realm, may do so by communicating with F. A. Magoun at M.I.T. — GRETCHEN A. PALMER, *Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

1919

Paul D. Sheeline writes: "After three years overseas I'm back in my old business again. My son, too, is home again and has entered law school. He was a captain in the Air Forces, was parachuted into France behind the lines, and fought with the French Maquis until our forces arrived. I have called you up on the telephone several times, but you never seem to be in." It was certainly good to hear from Paul again, and we hope we can get to see him and hear of some of his experiences over there.

On April 3, George Michelson left a note to say hello, but unfortunately your Secretary did not have an opportunity to see him. — Morton A. Smith writes from Great Barrington, Mass.: "I am still doing business at the Radio Shop — established in 1922 — and should be glad to see any who pass through Great Barrington."

We were sorry to hear of the death of Mrs. Ethel Benedict Gutman, research chemist, on March 6. The *New York Times* on the following day gave an account

stating that she had been a research chemist for the Presbyterian Hospital for more than 20 years. She was credited with the discovery in the blood of new enzymes that are important in diagnosing certain forms of cancer and for many years had applied biochemical techniques to medical research at the Columbia Presbyterian Medical Center; she had also developed many analytical methods. After attending the Northfield, Mass., Seminary, she was graduated in 1916 from Wellesley College. Later, she did advanced research work at Technology and received a master's degree. She left a husband, Dr. Alexander B. Gutman, and a brother, Thomas H. Benedict of Wilmington, Del.

The following changes of address have been received: William C. Haddock, Jr., has moved from Rydal, Pa., to 8216 Seminole Avenue, Chestnut Hill 18, Pa. Carley H. Paulsen has been promoted from the rank of commander to captain.

The news from Manila reported Aubrey P. Ames's informal talk on his experiences during his 26 years in the Philippines, at the Technology Club meeting there early this year. Aubrey spent three years in the Japanese prison camp at Santa Tomas. He represents the Standard Vacuum Oil Company in the Philippines. — EUGENE R. SMOLEY, *Secretary*, The Lummus Company, 420 Lexington Avenue, New York, N.Y. ALAN G. RICHARDS, *Assistant Secretary*, Dewey and Almy Chemical Company, 62 Whittemore Avenue, Cambridge 40, Mass.

1920

At this writing, about the middle of April, we already have positive knowledge that the reunion at the Sheldon House on June 14 is going to be really representative of the Class. If you're one of those who haven't yet signed up or have indicated that you were in the doubtful column, we can assure you that you had better make a really strenuous effort to be on deck. It's going to be the best reunion yet!

The initial reunion notice brought forth a few bits of news and changes of address. Art Littlefield, who is in St. Louis, announces a new son, born on December 14. Al Wason is back in these parts at 57 Dartmouth Avenue, Dedham. He served in the Army as a lieutenant colonel. Austin Higgins, Colonel, U.S.A., says he won't be at the reunion because he expects to be at Bikini, standing by for the big bang. Jack Coyle's new address is Old Academy Road, Fairfield, Conn. Mike Houghton has left Westwood, N.J., and will be stationed at the Bureau of Mines, Rifle, Colo. Ted Hobson's new address is 2948 Neil Avenue, Columbus, Ohio. Ted Kendrick's new address is Box 724, Richmond 6, Va. C. D. Carleton, a lieutenant colonel, returned his card from Rhoades General Hospital in Utica. His permanent address is 744 Hawthorne Avenue, Bound Brook, N.J.

Dorothea Brownell Rathbone deserves special mention for making a contribution to the class gift in memory of Cliff. Captain Harry Kahn's new address is 55 Broad Street, Matawan, N.J. Bunt Murphy has left New York and is now in Lawrence, Mass., at 32 Milton Street. Perk Bugbee received the Certificate of Achievement for the National Fire Protection Association, of which he is general manager, "in recognition of exceptional accomplishment in

behalf of the United States Navy and of meritorious contribution to the national war effort." He was presented the certificate by Assistant Secretary of the Navy for Air, Manager John L. Sullivan, in a ceremony in Mr. Sullivan's office in the Navy Building in Washington on March 19.

Word has just been received from George Des Marais and from Art Radasch of the sudden and untimely death of Heinie Forrest on April 15. George enclosed a clipping from the *New York Sun* containing the information that Heinie was assistant vice-president of the M. W. Kellogg Company, engineers and contractors, of 225 Broadway, N.Y. He invented several methods of cracking gasoline. He had been with the Kellogg Company since 1931; before that, he was an associate professor of chemical engineering and director of research at the Institute. His home was at 586 Ramapo Road, Teaneck, N.J. He leaves his widow and two sons. George writes that his popularity with his classmates was continued with his business associates and that the oil industry has lost a very capable man. Art writes that he has seen Heinie a number of times in his professional capacity and his estimate of Heinie parallels that held by George and, for that matter, by us all.

Your Secretary was delighted to receive the following letter from Ki Chun, 80 Seymour Road, Shanghai. Ki writes: "It has been so long since we last saw each other, but whenever I think of the time when we were together at the Institute, it brings back pleasant memories of the good old days. After these long suffering years of war in China, we in Shanghai are thankful that we survived, although I personally have gone through untold, bitter hardships in the cruel hands of the Japs. I was taken prisoner by them and put under strict surveillance until V-J Day. We were lucky that we did not starve. We have a grown daughter and son in America, the former just married, while the latter is taking his master's degree in business at Stamford University. My son, Gordon, was graduated from Technology in the fall of 1944. Shanghai is fast coming back again to a semblance of its pre-war days, and many of our American friends have recently returned here from the States. We are so glad to have them with us once more. Kindly remember me to all my old schoolmates and tell them I send my very best to them." — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

1921

Our 25th reunion party at East Bay Lodge, Osterville, on June 9 and 10 justifies at this advanced date all the superlatives which you are undoubtedly showering on it from your postdated point of view. From Alumni Day at Cambridge on June 8 through to our actual anniversary on the 10th, Dan and Ray and all the members of the various committees provided what it takes to put this year's session in its rightful place as most outstanding of all of our series of top-notch five-year reunions. Our thanks to all those at the Institute and among the Class who participated in carrying the burden of many months of planning, preparation, and execution of the plans for the party. Their reward is largely your evident enjoyment and the anticipa-

tion of your continued support of the Institute through the Alumni Fund, class affairs, and your own Class Secretaries.

A complete report of the reunion must await a later issue of The Review, and pending its appearance, here are brief items from some of the questionnaires: Frederick W. Adams, X, is director of research of the Clark Thread Company, New York. Fred has two sons and makes his home in New York City. Paul N. Anderson, IX-B, has been president and general manager of the Dahlstrom Metallic Door Company, Jamestown, N.Y., for the past 13 years. Paul is a director of six organizations, a trustee of two, and a member of the local utilities commission. Of his five boys, the oldest is a sophomore at Technology after three years in service. The second boy, Frank, was graduated from Andover and is now in the Navy. Daniel will graduate from Andover this month, and Quintus is finishing his first year there. The youngest, Timothy, who is 13, is still at home. Garvin Bowden, XV, is with the Office of Price Administration in Boston and lives in Wellesley. Mich has two children, Nancy, who is 24, and Garvin, Jr., 20.

Frederick W. Binns, X, carries on in the practice of chemical engineering at 131 State Street, Boston. Fred has two children and one grandchild. Edward W. Booth, IX-B, is with the Barbour Stockwell Company, Cambridge. Scripps has three children and makes his home in Waban. Laurence O. Buckner, VI-A, general sales manager of the Metropolitan Edison Company, York, Pa., has one son, Jim, who is 17. Harry Butters, III, Boston insurance engineer, announces somewhat belatedly the arrival of Roberta almost a year ago. Philip W. Clark, XIII, wonders whether any of us have begun to exhibit the usual signs of age and would rather sit under a fig tree with a mint julep than go canoeing with a blonde. Correspondents may enlighten Phil in care of the Electric Boat Company, Groton, Conn., where he is a naval architect.

J. Ernest D. Clarkson, II, is in charge of steam boiler plants and distribution for the Atlantic Refining Company, Philadelphia. Robert S. Cook, I, is with the New York State public works department as a highway engineer for the Rochester district. Josiah D. Crosby, X, is technical supervisor for the Hood Rubber Company, Watertown, Mass. John D. Crowley, II, was a major of Ordnance attached to the Air Forces for three years and is now back with his own company, Equipment Engineering Company, New Haven, who are manufacturers of materials handling and industrial equipment. He wants to hear from Frank Coldwell and Jack Bayle. Ralph E. Ferdinand, XV, is general manager of the Joslin Show Case and Fixture Company, Boston. Sons Paul and Warren are respectively 14 and 12 years old.

Luther Goff, II, writes that he is the advertising manager of Brown and Sharpe, Providence. The class Junior League welcomes Brian, aged one, and Richard, who is two, to the fold. Luther has three older children, Virginia, 22, Luther, 17, and Gretchen, who is 14. Max Goldberg, VI, is the owner of a beauty salon in Newark, N.J. Harry I. Granger, VI, is treasurer of the town of Weymouth, Mass. C. Doane Greene, X, is on the staff of the M. W.

Kellogg Company, New York City, and lives in New Rochelle. Joan is 16 and Stephen, 14, and both are well on the way to take swimming laurels away from the Judge. Herbert W. Gwynn, II, is active in fire prevention work in Chicago. Munroe C. Hawes, X-A, New Jersey real estate magnate and mayor of Sea Girt, has five children: Aimee, 22, Munroe, Jr., 21, Elizabeth, 17, Alexandra, 10, and George, 2.

Sumner Hayward, X, who is transmission engineer of the New York Telephone Company, says his 18-year-old son is going to Franklin College, Indiana, this fall if the draft permits. John J. Healy, Jr., X, is director of development of the Merrimac division of Monsanto Chemical Company, Everett, Mass. Melvin R. Jenney, VI, is a member of the firm of Jenney and Hildreth, patent lawyers with offices in the Statler Building, Boston. Mel has two boys and a girl — Richard, who is 15, Robert, 12, and Louise, 10. Irving D. Jakobson, XIII, is president of Jakobson Shipyard, Inc., Oyster Bay, N.Y. Peder Daniel is now three years old. S. Murray Jones, VI, heads the technical service division of the electric and steam sales department of the Boston Edison Company. He has two children, Claire, 13, and Malcolm, who is 10. Herbert A. Kaufmann, X, makes his home in New Rochelle, N.Y. He has two children, Jane, 16, and Peter, 14.

Joseph G. Kaufman, X, operates his own radio and appliance store at 20 Province Street, Boston. Irene is 16 and David, 14. G. Howard LeFevre, III, is assistant vice-president of the United States Smelting Refining and Mining Company, 57 William Street, New York City. Edmund J. MacDonald, I, is engaged in construction work in Auburndale, Mass. Louis Mandel, II, makes his home in South Orange, N.J. He has two daughters, Marcia and Brenda, respectively 14 and 10 years old. Leo Mann, V, is director of the Chemical Division of the Rose-Derry Company, Newton, Mass. Robert F. Miller, XV, is a consulting engineer, formerly associated with Stevenson, Jordan and Harrison, and since the first of this year with his own company of management engineers having headquarters in Cleveland, Ohio. Bob has six children, ranging in age from one to 12 years.

Donald G. Morse, X, is a partner in James F. Morse and Company, Boston. Richard is seven and Douglas is four years old. Harry M. Myers, X, is treasurer of S. A. and H. Myers, Inc., of Boston. His two daughters are Suzanne, nine, and Nancy, seven. Philip A. Nelles, Jr., II, spent five years with Army Ordnance, ending with the rank of major. He is again a civilian and serves as industrial gas engineer for the Malden and Melrose Gas Light Company. He makes his home in Stoneham, where he has one daughter, Patricia, who is 16. Herbert K. Nock, VI-A, is sales manager of the Smithcraft lighting division of the A. L. Smith Iron Company, Chelsea, Mass. Herbie has a married son, 24 years old, who is a second lieutenant, now stationed in Japan. Betty, who is 22, is the employment manager of a Boston department store. Jean and Joan, the 21-year-old twins, are in school. For the record, Mel Rose has twin daughters who are now 20, and Manny Green has twin boys who are 21 years old. Vic Hassold claims the distinction of having the only triplets in our

Junior League — two boys and a girl who are now 16 years old. Anyone who has been slighted by being omitted from this summary will receive due credit if we are notified promptly.

The 15th decoration for a member of the Class has been awarded to Raymond G. Moses, I, a brigadier general, who has been given the degree of Officer of the French Legion of Honor. Thomas F. Murphy, VI, is assistant Federal commissioner of patents. Ernest Pauli, XV, is a manufacturer's representative in New York City. He has a 21-year-old son, Harold. Leo C. Pelkus, X, is sales manager of the Boston office of E. L. Wiegand Company, manufacturers of industrial electric heating equipment. Diane is now two years old, and Leo adds, "Dorothy was born on May 1, 1945. Looks like an all-girl orchestra coming up instead of an infield." Larcom Randall, VI, is with the industrial advertising and printing firm of T. O. Metcalf Company, Boston. He has three children and makes his home in Wellesley. Herbert W. Reinhard, XV, manages the sale of miscellaneous equipment for the War Assets Administration, Boston. Herb has two sons, William, who is 12, and a welcome newcomer, Richard, who is four months old.

Fred M. Rowell, II, is general manager of the Plymouth County Electric Company, and resides in Plymouth, Mass. He has two children. John T. Rule, XV, is associate professor of drawing and descriptive geometry, in charge of the Section of Graphics at the Institute. John has three sons. Joseph J. Schaefer, V, is in Wyandotte, Mich., as the director of development for the Wyandotte Chemicals Corporation. His son Joseph, Jr., was graduated from Course X at Technology in 1944. His daughter, Mary, is 19. George Schnitzler, II, has been connected with the National Bureau of Standards at Washington as a physicist for the past 23 years. He is now engaged in the testing and inspection of both filament and gaseous discharge lamps. George's daughter, Laura, is 13. He challenges all comers to a game of tennis.

Despite Bob Miller's claim, top honors for the largest family go to William J. Sherry, X — at least until all records are in. Bill and his family live in Tulsa, Okla., where he is an oil producer. The family includes six daughters and one son: Patricia, 16, Margaret, 14, Mary, 11, William, Jr., 8, Anne, 5, Jane, 3, and a recent arrival to be duly greeted, Teresa, who is now seven months old. Saul M. Silverstein, X, X-A, is president and general manager of the Rogers Corporation, Manchester, Conn. Slivver has three children — Lee, who is 16, Phyllis, 14, and Barbara, aged 12. Roy D. Snyder, XIV, is the owner of a milk plant in Bloomsburg, Pa. His oldest son has been discharged from the Army and has gone to Bucknell. James will be graduated from the Naval Academy this month as Roy, Jr., enters. Nancy is in elementary school. Albert H. Wechsler, I, is vice-president and general manager of the Converse Rubber Company, Malden, Mass. His oldest girl, Jean, is at Vassar. Anne is 16 and Joel, 10. Charles A. Williams, VI, vice-president of United Illuminating Company, New Haven, Conn., has been re-elected as president of the New Haven Chamber of Commerce. Charlie has

a daughter, Molly, who is 20 and a son, Billy, now 18.

Everett J. Wilson, II, is superintendent of the Newport Gas Light Company, Newport, R.I. He has a girl of 16, Betty, and two sons, Jim and Frank, who are 15 and 12, respectively. George B. Wetherbee, II, makes his home at 132 Oak Street, Braintree, Mass. Katharine is 18 and Paul is 16. Edward P. Wylde, X, X-A, is the owner of the Harbor Machine Company, North Adams, Mass., builders of special machinery. Ed has four children. Harold M. Estabrook, II, has been appointed agent for the Aetna Insurance Company for the State of Maine.

Manuel S. Vallarta, XIV, VIII, the director of the National Polytechnic Institute of Mexico, has been named as the head of Mexico's four-man delegation to the Atomic Committee of the United Nations Organization. Val was formerly professor of physics at Technology, where he obtained his doctorate in 1924. He continued his studies in Leipzig and in Berlin. He has recently been in Washington in connection with special studies in the field of education.

New addresses are listed for: Dr. Ivan F. Chambers, X, Alson Court Apartments, 110 Colville Road, Charlotte 4, N.C.; Colonel Merle H. Davis, X, Rochester Ordnance District, Rochester 4, N.Y.; Major General Richard Donovan, 3601 Connecticut Avenue, Northwest, Washington, D.C.; T. Dillwyn Dutton, VI, 6654 Barnaby Street, Northwest, Chevy Chase 15, D.C.; Alfred C. Garrigus, II, C. J. Garrigus Company, Haddam, Conn.; Dr. Flemmon P. Hall, V, Pass and Seymour, Inc., Syracuse 9, N.Y.; Donald H. Hatheway, VI, 90 Walton Park, Melrose 76, Mass.; Elmer L. Oliver, I, 34 Court Street, Rochester 4, N.Y.; Irving K. Peck, X, 394 Jefferson Drive, Mt. Lebanon, Pittsburgh, Pa.; J. Trevor Peirce, XV, Peirce-Phelps, Inc., 437 North 5th Street, Philadelphia 23, Pa.; A. T. Eric Smith, I, 78 Dufferin Road, Hempstead, Montreal 29, P.Q., Canada.

How about writing to your Assistant Secretary right now while it's on your mind? — **RAYMOND A. ST. LAURENT**, Secretary, Rogers Corporation, Manchester, Conn. **CAROLE A. CLARKE**, Assistant Secretary, International Standard Electric Corporation, 67 Broad Street, New York 4, N.Y.

1923

From Charlie Locke '96 I have the following items: Norman L. Weiss has resigned as mill superintendent of the Santa Barbara unit of the American Smelting and Refining Company, Santa Barbara, Chih, Mexico. He is now working for the Dow Chemical Company in San Francisco. — L. S. Hayes has joined the staff of the American Smelting and Refining Company's mining department in New York City. In Washington, since early in 1944, he acted as engineer-analyst with the Office of Price Administration branch of the quota committee of the premium price plan for copper, lead, and zinc.

Word comes that John F. Gunther, formerly Assistant Professor of Architecture, who had made his home in Hancock, N.H., died on March 21.

I had about made up my mind to a very short set of notes this month when, on

April 25, the day they were due, I had a call from Robert V. Burns. The last time Bob Burns appeared in these dispatches he was headed back to Ceylon, in the summer of 1941. The war clouds were even then threatening, and he had to leave his wife in this country. She, therefore, has been sitting out the war in Philadelphia until Bob got back to this country in February of this year. As it turned out, it was just as well she did not go back to Ceylon with Bob, as the threat of Japanese invasion caused the women to be removed from the island shortly after Singapore fell.

I got Bob to outline his travelogue. He left Vancouver on the ninth of July in 1941 and got to Australia the first of August, having made stops in the Fiji Islands and in Auckland, New Zealand. In Australia he just missed a ship bound for India. Not being able to get aboard looked like tough luck at the time, but looking back, he doesn't think it was so bad: the particular ship was never heard from again. During seven weeks of enforced sojourn in Australia awaiting passage to India, he had a chance to look at the irrigation and flood control works in Queensland, New South Wales, and Victoria.

When he finally got on his way to Calcutta, he made stops at Singapore and Rangoon, points soon thereafter to become historically famous as they were swept by the Japanese. He went from Calcutta to Ceylon overland to make a stop at the Indian Waterways Research Station at Poona and reached Colombo at the end of October.

When Singapore fell in 1942, Ceylon became a front line of the war and fought off numerous Japanese raids. In the worst, on Easter Sunday morning, the Japanese threw 75 planes at them. The British air forces on the island struck back fiercely with a small force of planes and eventually convinced the Japanese that Ceylon was too tough. The Japanese invasion forces were transferred to Burma.

During the war Bob continued in charge of the Hydraulic Research Laboratory, a Ceylon government institution, doing flood control and irrigation work. War matters, such as defense and food production, engaged the technicians on the island for some of their time. Bob says he is eligible for a period of leave every four years. In the last one he came back to the United States to see his wife again and attend to certain business for his laboratory. While here, he has been in contact with engineers of the United States Bureau of Reclamation, both in Denver and in Washington. This Bureau and the Army Engineers perform, in this country, much the same office that the Hydraulic Research Laboratory does in Ceylon. For the benefit of those who may not know Ceylon, it should be added that the rainfalls there sometimes amount to 20 to 30 inches a day, as much as 50 inches in five days, and yearly totals of 350 inches — explaining why a hydraulic laboratory is pretty important in Ceylon.

Bob expects to leave the United States for England sometime in August and to get home in October. Mrs. Burns will be with him this time. Bob reminds me that if you take a trip around the world by sea you are practically certain to hit Ceylon. In such a case he would like to have anyone passing make it a point to look him up. In this

globe-girdling business, Bob may speak as an expert, this being his third trip. — **HORATIO L. BOND**, Secretary, 457 Washington Street, Braintree 84, Mass. **HOWARD F. RUSSELL**, Assistant Secretary, Improved Risk Mutuals, 60 John Street, New York 7, N.Y.

1926

Recognition for an outstanding performance in the Navy has come to Richard Whiting. Shortly after his promotion to the position of general patent counsel for the Navy last winter, he was presented a Letter of Commendation with Commendation Ribbon from the Secretary of the Navy, whose commendation read, in part: "Commander Whiting capably applied his extensive experience in law to the field of royalty adjustment and renegotiation, solving many technical and organization problems incident to the creation of a central section for the handling of all Navy Department matters arising in these fields." Dick expected to be out of the Navy soon and plans to engage in private patent work in Chicago for at least a year. We shall have an opportunity to extract further details from him at the reunion on June 22.

We have news this month of two of our Course IV men: Shepard Vogelgesang has returned to Whitefield, N.H., after Navy service. Theodor C. Muller of New York City was in Springfield, Mass., on April 18 to speak at the Museum of Fine Arts on "Design and Decoration for Your Dollar." He was one of a series of weekly speakers who included William W. Wurster, present Dean of our School of Architecture and Planning. — Course XV men will be interested to have news of Nelson Wilmer and Richard Rothschild. The former has been made Chicago district sales manager of his company, the Mathieson Alkali Works, with which he has been associated since 1931. Rothschild, formerly a structural designer with the Alabama highway department and more recently in the Army, has become affiliated with the architectural and engineering firm of Sherlock and Smith in Montgomery, Ala.

Piscatorial items in this column are rare; news from classmates to the north, equally so. Hence it is the more welcome to be able to quote briefly from the fine tribute paid to Louis Bérubé in the March issue of *Canadian Fisherman*: "His work in connection with the establishment of the School of Fisheries at Ste. Anne is modestly hidden . . . but he played a leading part in its organization. Years ago, when he was engaged in the fish business, he joined the Canadian Fisheries Association and was one of the very few Quebec producers to do so. He is widely travelled and has represented his native province in fisheries matters and economic development before numerous official bodies and private associations, and he is the author of several works on provincial fisheries. . . . His ambition, inspired by his education and experience, is to see Quebec's fisheries conducted along modern lines with the fishermen and producers receiving an adequate return for their efforts and capital invested." Professor Bérubé, who holds the post of secretary of the board and professor of applied economics at the School of Fisheries of Ste Anne de la Pocatière,

Quebec, took postgraduate work at M.I.T. in commercial fisheries technique, studying under Professor Samuel C. Prescott '94.

Two of our classmates whose professional careers have differed from those of most '26 men are Francis van Buren and Raymond Blakney. On March 1, Van Buren became superintendent of the Cape Cod Hospital at Hyannis. In an interview in a local paper, he is quoted as saying: "A knowledge of medicine or of nursing is not of very great value to the administrator. Basically, this is an administrative job requiring a knowledge of business and organization. The person running the hospital doesn't take care of the patients; his job is to keep the organization functioning so that the physician and nurse can work wholly for the benefit of the patient." Before his recent Army service, Van Buren was for 11 years superintendent of the Children's Hospital in Cincinnati. He is married and the father of a young daughter. — Blakney, who this past winter was interim pastor of the Church of the Pilgrims in Dorchester, is returning to China. He and his wife have been appointed Congregational career missionaries by the American Board of Foreign Missions. One of their sons is now a student at Williams College; another son is in the Navy; and their daughter is a student nurse in Cleveland.

We have recently learned that Warren de Lancey is president of Engineering Services, Inc., in Springfield, Mass.; that Hazel M. Hunt is teaching chemistry at the Garland School in Boston; that Martin Grossman is in New York, with the Celanese Corporation of America; and that Raymond Mancha is vice-president in charge of ventilation for the Joy Manufacturing Company of Pittsburgh.

Chenery Salmon and his able committee have virtually completed plans for the 20th reunion on June 22 and 23, at the Wianno Club on Cape Cod. Inquiries, if you have any, will reach him via Box 2197, Boston 6, or Capitol 4200. — JAMES R. KILLIAN, JR., *General Secretary*, Room 3-208, M.I.T., Cambridge 39, Mass.

1927

As predicted in last month's class notes, your Secretary is now in Latin America, and his secretary substituting for him.

Our mailbag this month brings forth news from two of your classmates who have recently come back into civilian life. Elmer Andrews writes as follows from 80 Corona Road, Rochester, N.Y.: "I got out of the Army officially on October 24 and went back to work as mechanical engineer for Eastman Kodak at Kodak Park in Rochester. My particular work involves design and installations of new equipment for processing 16-millimeter and 35-millimeter film in our stations throughout the United States and involves considerable traveling. I am writing this from our plant at 1017 North Las Palmas Avenue in Hollywood, after a job in our place at San Francisco. I hope to leave here by the middle of April and return to Rochester, then a little later go to one of our jobs in Washington, D.C., and thence to Atlanta. It is interesting, but hard getting hotel rooms."

We have also heard from Walker K. Johnson, who writes from 46 Melrose Street, Lawrence, Mass.: "I was serving

with an Engineer Aviation Battalion, training at Gulfport, Miss. I was hospitalized not long before the outfit was scheduled to move overseas, so was cut off the shipment and moved back to Tampa, Fla. This was in early 1945. I continued to serve at the Engineer Aviation Unit Training Center at MacDill Field, Tampa, until my separation from the service in mid-March. I am now on terminal leave and looking around for a new connection. I was with the Tennessee Valley Authority seven years before entering on active duty in July, 1942, but since T.V.A.'s active dam-building program is over, I doubt that I shall return to Tennessee. I have run into a few Course I classmates since coming home; namely, Al Gifford, Assistant Professor in the Civil Engineering Department at the Institute, Jerry Spurr, who is back on his old job with the Metropolitan District Commission on Somerset Street, and Reggy Jacobs, back with the state highway commission. I also had a brief reunion with Lauritz Rasmussen, who is likewise with the state highway commission. I have heard that Jack Boyle and Freddie Byron are in the construction business together around Boston, but haven't seen either one."

The Boston Sunday Post of April 14 carried a long and very interesting article on William H. Richards. Here it is in brief: "After graduating from M.I.T. as a chemical engineer, Bill Richards was employed by one of the largest automobile manufacturers in the country. While there, he became interested in auto racing, built himself a racer, and entered the famed Indianapolis 500-mile classic. He was well up among the leaders when an accident ended his racing career almost as abruptly as it started. After months of hospitalization he returned to Boston and en route met a classmate, Pete Volante of Newton. It was this chance meeting on the train, the renewal of an old acquaintance, that caused him to forsake his planned profession and turn to the soil. By the time they reached Boston their plans were made, and in 1935 they purchased a small farm in Portsmouth, R.I. By the end of six years, during which time they applied modern methods of mechanical and scientific farming, they had acquired four additional farms around Portsmouth. At this time, Bill Richards' partner became ill and was forced to retire. After discovering he couldn't possibly operate five scattered farms economically, he sold the entire works and settled on a farm in Forestdale, on Cape Cod, which he calls Veg-Acres. After extensive study, Bill selected broccoli and iceberg lettuce as his two main products, and at the end of five years he has become Massachusetts' largest producer of broccoli and nears the top with his iceberg lettuce. To his amazement, his knowledge of chemical engineering was being utilized on the farm more than in some industrial plant or scientific laboratory."

The New York Times of April 17 ran the following article: "Prof. James G. Van Derpool, head of the Art Department at the University of Illinois, will succeed Talbot Hamlin as librarian of Avery Library when he joins the faculties of Columbia's School of Architecture and School of Library Service on September 1, Dr. Frank D. Fackenthal, acting president of Columbia

University, announced last night. Mr. Hamlin resigned his post as librarian to do editorial work at Columbia. Professor Van Derpool, who was born in 1903, received his Bachelor of Architecture degree from . . . Technology in 1927 and a master's degree in Fine Arts from Harvard in 1940. Before taking his master's degree, he did research work at the American Academy in Rome and at Atelier Gromort of the Ecole des Beaux Arts in Paris, in addition to architectural practice in Boston. Before joining the University of Illinois staff, he served as an instructor in the history of architecture at Rensselaer Polytechnic Institute in Troy, N.Y."

By the time these notes are printed, you should be planning to have a merry old time at the Alumni Day celebration on Saturday, June 8. And you from whom we haven't heard lately — let's have some word as to your activities so that our small part of The Review may be kept interesting for us all. We are signing off now until next fall, so until then Happy Fishing! — JOSEPH S. HARRIS, *General Secretary*, Shell Oil Company, Inc., 50 West 50th Street, New York 20, N.Y.

1928

Here's the list of 1928 men present at the Alumni Banquet: Chris Case, Jack Chamberlain, Earl Crawford, Jim Donovan, Thurston Hartwell, Pete Harvey, Ralph Jope, Bill Kirk, Mark Kolligian, Dave Mathoff, Johnny Melcher, Art Nichols, Dave Olken, Johnny Praetz, Bob Proctor, Walter Smith, Willis Tibbetts, Ed True, and yours truly. It was the best turnout at a Boston banquet for many a moon, and the Class had a room to serve as a rallying point and as a place to swap yarns about friends, family, and jobs. The swapping was in high gear most of the time.

This year marks our 18th anniversary, yet, as appleblossoms were bursting and bluebirds twittering, even another sign of spring cheered us up and made us feel young again. The announcement that so softened our middle-aging arteries was the following: "Marcus Waldo Keyes will be married to Mary Agnes Holbrook on May 11, at Trinity Church, Newton Center, Mass." Waldo is now a lieutenant commander in the Naval Reserve, and the Class sends sincere congratulations to its latest benedict.

Benny Hough's new address is 237 Renwick Drive, Ithaca, N.Y., and his new job is that of assistant dean of engineering at Cornell University. So let's send him a load of congratulations. By the way, Benny, how's your poker these days? Ray Wofford is now manager of the agency maintenance division of the National Biscuit Company. He has been with this company since 1933 and has worked in all 48 states for them. Before 1933, Ray worked on the San Francisco Bridge and with architectural firms in Boston and Texas. He now lives in Jackson Heights, N.Y. Bob Harris was recently made a full professor of nutritional biochemistry at Technology. That's great news, Bob! — GEORGE I. CHATFIELD, *General Secretary*, 6 Alben Street, Winchester, Mass.

1932

A few weeks ago, while attending the first postwar meeting of the Technical Association of the Pulp and Paper Indus-

try, I ran into Earl Anderton. Andy was still in uniform and was on terminal leave from the Navy. He had been in the Navy for several years and had just rejoined the technical staff of the Scott Paper Company. Andy had done considerable traveling and had made contacts with several members of our Class. Some of what he passed along may be old stuff, but late news is better than none.

Rolf Eliassen, whom you may remember in the Tech Show, was with the Ninth Service Command, stationed for a while at Salt Lake City. He was a major and apparently specialized on camp sanitation problems. — Don Feters is in Chicago in the contracting business, and Bob Emerson is with the Manifold Supplies Company of Brooklyn. Bob was also at the T.A.P.P.I. meeting. Ed Poor was probably present but I missed him. He was formerly with W. C. Hamilton and Sons, paper manufacturers, but now works for American Cyanamid. — When last heard from, Bill Barker was with Firestone and before the war was sales manager for southern New England. — Al Stockwell has two children and is technical director of the New England Lime Company at Adams, Mass. He is a devotee of skiing (in that country he has to be) and during the war traveled extensively in connection with the magnesium developments. — Joe Winkler, II, is with the Savage Arms Corporation at Utica, N.Y. — Ben Archambault, Office of Scientific Research and Development, is in England. Since Ben is somewhat socially inclined and is attached to the Embassy there, Andy says he wasn't surprised to meet several Englishmen who knew him.

There should be some word of Johnnie Crowther, but all we know is that he served in the Chemical Warfare Service as a major, as we recall, and doubtless did a creditable job while dispensing humor on the side. — As for me (Bill Kirkpatrick), all I can report is that at last I have a son (score to date: 2-1) — and that reminds me, Bill Holst is back in this country (or was a year ago) and is married and I think also "pa" by now. How about a line or two to one of us listed below to bring your classmates up to date? You may be living in the same block with one of us and don't even know it. — CLARENCE M. CHASE, JR., *General Secretary*, 1207 West 7th Street, Plainfield, N.J. *Assistant Secretaries*: CARROLL L. WILSON, 1530 P Street, Northwest, Washington, D.C.; WILLIAM A. KIRKPATRICK, Allied Paper Mills, Kalamazoo, Mich.

1933

A few items of considerable interest to all in the Class have come over my desk in the past month.

Arra Steve Avakian of York, Pa., writes in part as follows: "I went in the Ordnance Department at Aberdeen Proving Ground in November, 1940, and engaged in automotive research and development. In 1942, I joined the office of the Chief of Ordnance, Detroit, Mich., in the development division. I went overseas for six months in 1944 on a special assignment in Italy and France. In November, 1945, I was discharged as lieutenant colonel from the Ordnance Department. I then joined the York Safe and Lock Company and in January, 1946, became chief engineer of our

organized company (York Industries, Inc.). My family consists of my wife, my three children, and my mother."

A note from Dave Lee, dated April 1, reads in part: "To make it short and sweet, on February 1, I left the Chrysler Corporation after 12 years with them and came to Ford as truck advertising manager. Like so many other Tech men one meets, I have strayed quite far from engineering. My wife and I have two boys, an ancient farmhouse in the country, and a 1919 model truck for me to expend my technical efforts on."

Thomas K. FitzPatrick writes: "To catch up with personal news, I have recently been appointed head of the department of agriculture here at Iowa State, as well as college architect." Iowa State is at Ames, Iowa.

We have received a note from Miss Reina Sabel, sister of Reinhardt G. Sabel, who passed away of a heart attack on Sunday, February 25. Many of us who knew Sabel surely are shocked to hear of his death at this early age.

Robert M. Love, formerly a colonel, is now president of the All American Aviation, Inc., operator of the Air Pick-Up service. During the war Bob was an officer in the Air Transport Command. Before the war he was president of Inter-City Airlines, Inc., with Boston as the home port. Word has come in that Frank MacMahon was promoted to the rank of full colonel before his release from the Air Forces. Entering the service in 1941, he did antisubmarine patrol work in the South, attended Staff Officers' School, after which he was assigned to Headquarters, Army Air Forces in Washington, D.C., to serve as chief of the transport facilities section. He later became chief of the troop carrier branch of training in the Air Forces, and in 1943 he went to England to determine what specialized training was needed for troops aboard carriers preparing for the Normandy invasion. Completing this assignment, he went to Senior Staff Officers' School and later attended a school for Army pilots, where he studied about and flew new helicopter planes. Shortly before V-J Day he was transferred to the Ninth Troop Carrier Command as assistant chief of staff. More recently Frank has blossomed in the local news by proposing that the city of Quincy set up a municipal airport, and Frank is head of the new Aircab, Inc., which will operate amphibian planes and helicopters to provide service throughout Massachusetts.

We thoroughly enjoyed a pleasant visit from Charlie Quick, who attained the rank of full colonel in the Signal Corps. Charlie spent two years in the Pacific, moving from Brisbane to Tokyo, during which time he was attached to the staff of General Kenney '11. Before entering the service in 1940, Charlie was with Detroit Edison. — We want to report one marriage — Ruth P. Baker to Captain George F. Frazier in Arlington, Mass. — and the engagement of Marion Kranhold to Thomas F. Twomey in Boston.

Word has come in that Steve Rhodes continues in his extracurricular political career in Taunton, where he has served for several years on the school committee. Steve is vice-president and superintendent of M. M. Rhodes and Sons. Last fall Pete du Pont was appointed a state director of

the Farmers Bank of Delaware. Pete is in the trade analysis division of the Du Pont Company. — As a final choice bit, all in the Class will be interested to learn that Nat Goodman has recently opened a factory in Jersey Shore, Pa., manufacturing men's shirts. — GEORGE HENNING, JR., *General Secretary*, Belmont Smelting and Refining Works, Inc., 330 Belmont Avenue, Brooklyn 7, N.Y. ROBERT M. KIMBALL, *Assistant Secretary*, Room 3-208, M.I.T., Cambridge 39, Mass.

1935

Reunion plans are under way for September, as you will have heard before you read this. We had a dinner meeting of the local group on April 8, with 17 classmates in attendance: Leo Beckwith, Dave Cobb, Jack Colby, Beverly Dudley, Perk Ehrlich, Gerry Farr, Gerry Golden, Bob Granberg, Larry Hall (all the way from Manchester, N.H.), Frank Muldowney, Luke Packard, Dick Rice, Howard Staley, John Taplin, George Valley, Ernie van Ham (the only bachelor!) and the undersigned. Most of these men have agreed to take an active part in the work of the reunion committee, chairman of which is Jack Colby, as we announced last month.

Jack's plan is to have a large committee, with representatives in all the large centers of population, whose jobs will be to get their local groups out to the reunion. In addition to the above list, some of the men chosen to work on the committee are John Bainbridge, Bart Chapman, Pete Grant, Fred Haigh, Phil Johnston, John Mooring, Bernie Nelson, Jim Notman, Hank Ogorzaly, Jack Orchard, Whit Stueck, and Otto Zwanzig. We can't yet announce the exact place and time, but probably we'll meet on the Connecticut shore shortly after Labor Day. None of us should need urging after such a long separation, and the committee expects a record attendance. We'll keep you posted on developments.

A. Rufus Applegarth, always interested in electronics, is now vice-president of the Aeronautical Corporation, Camden, N.J. Rufus had an article on "Synchronizing Generators for Electronic Television" in the March issue of *Proceedings of the Institute of Radio Engineers*. In the same issue it was announced that Norman Kornetz is now project engineer of Westinghouse television-receiver development. — Gerry Farr has formed his own consulting research laboratory for biological and biochemical problems, especially with respect to foods. Gerry's lab is on Massachusetts Avenue only two blocks from the Institute. — Bob Olsen, out of the Army after a long term at the Springfield Armory, now lives in Needham and works for Jordan Marsh. Bob has two boys, aged about three and one, and agreed with your correspondent that this was an exacting, yet rewarding, situation.

Recent marriages include those of Elna Stenberg to Art Marquardt in Boston on February 23, and of Mary Elizabeth Moore to Charlie Partridge in Proctor, Vt., on March 2. The engagement of Jeannette Lacy of Spokane to Lorin Presby was announced on February 10. — WALTER H. STOCKMAYER, *Acting Secretary*, Room 6-227, M.I.T., Cambridge 39, Mass. DUDLEY A. WILLIAMS, *Assistant Secretary*, Room 6-127, M.I.T., Cambridge 39, Mass.

1938

We had a nice letter from Dick Muther this week. As we reported last month, he was married in February to Louise Scurlock in Arkansas en route from Washington, D.C., to the Naval Air Station in Alameda, Calif., where he is teaching a three-months intensive course in management and industrial engineering. He hopes to be back at the Institute in June to shoulder part of another Navy production engineering course. He thinks married life is pretty fine and that he has picked the only one. — Your Assistant Secretary represented the Class on April 13 at Norm Bedford's marriage in Hingham, Mass., to Hilda Lea. The wedding was a very lovely one in a beautiful old white colonial church typical of New England. They will live in Hingham, and Norm has taken over his father's elevator business since his father's death.

We have only lately received word that Walter Paige was killed in action in France in August, 1944. Our Class seems to have contributed its full share of gold stars to the M.I.T. service flag. — Boonrod Binson is studying at Harvard. He was previously a captain in the Siamese Army. Bill Towne is out of the service and living in Winchester, Mass. Bernard Zuckerman is also out and living in Long Island City. — Thanks to word from the Register of Former Students, we have learned that Paul Black has moved from Wollaston, Mass., to Bayside, N.Y., that Al Clogston has gone from Melrose, Mass., to the Bell Telephone Laboratories in New York City, Lloyd Bergeson from Philadelphia (Cramp Shipbuilding) to Endicott, N.Y., and Frank Gardner from Mahwah, N.J. (American Brake Shoe) to Pittsfield, Mass. How about telling us what your new job is? And that goes for others, too. — DALE F. MORGAN, *General Secretary*, Carbide and Carbon Chemicals Corporation, 30 East 42d Street, New York, N.Y. ALBERT O. WILSON, JR., *Assistant Secretary*, 32 Bertwell Road, Lexington 73, Mass.

1939

The romantic month of June brings much appropriate activity; engagements include those of Os Stewart to Lucille Baxter Young, of Robertson Youngquist to Lila Marcelle Hinze, of Frank Bent to Winifred Harper Nixon, and of Latimer MacMillan, an Army captain, to Gertrude Hodges.

Os Stewart, a major, is now on terminal leave, having served in the China-India-Burma theater with the Office of Strategic Services. Robertson Youngquist is stationed in Washington in the Bureau of Aeronautics. Frank Bent is associated with the Parlin, N.J., plant of the Hercules Powder Company. Lat MacMillan has covered himself with glory and but recently returned from 40 months overseas. He served with Patton's Third Army in the Second Armored Division of the Signal Corps and is stationed in Bamberg, Germany, with the Army of Occupation, 97th Signal Battalion. At last word he was in the States on a 45-day leave. The Silver Star was awarded to Captain MacMillan for gallantry in action in Urach, Germany. His citation reads in part as follows: "During one of the greatest concentrations of shelling encountered on Urach, Germany, it was essential that communica-

tions be maintained to this unit because of the important nature of their mission. During the night it was necessary to send wire patrols into the town in order to repair the breaks in the line due to enemy mortar artillery fire. The problem was for several linemen to work right through the streets of the town on a very dangerous mission that would require at least several hours of exposure to shell fire without the advantage of any cover. Captain MacMillan went forward with three men who volunteered to perform this extremely dangerous mission, with full realization of the danger involved. Because of the number of breaks in the line, it was necessary for this group to work for six hours in the streets of Urach with artillery and mortar shells constantly falling near and around them. In spite of harrowing experiences, Captain MacMillan continued with complete disregard for his own safety and inspired his men by his personal example, and they completed the work on this vital communication line."

And there is now a Mrs. Herman H. Hanson, the former Mary I. Gilbert, who recently married Lieutenant Hanson in Sharon, Pa. After a wedding trip to Williamsburg, Va., they will make their home in Alexandria, Va., until Herm's release from the service, after which they expect to live in Chicago. — From Jim Laubach, a lieutenant commander, we learn that he's now back in Boston with his ship assigned to the Sixteenth Fleet, which is the East Coast inactive fleet, and that he's being kept busy with all the painting and preserving required for placing the ship in the proverbial moth balls.

With best wishes to you all for a nice summer — and we guarantee to print all news received during said summer in the fall issues. — STUART PAIGE, *General Secretary*, 336 Brookbend Road, Winton Park, Fairfield, Conn. ROBERT C. CASSELMAN, *Assistant Secretary*, 271 Cypress Street, Newton Center 59, Mass.

1940

Our Class wishes to express its sympathy to Mr. and Mrs. Curt Teich, of 535 Longwood Avenue, Glencoe, Ill., who were recently notified by the War Department that their son, Lawrence E. Teich of our Class, listed as missing since the fall of Corregidor on May 7, 1942, has been declared legally dead. Lieutenant Teich was graduated in 1936 from Northwestern Military and Naval Academy, Lake Geneva, Wis., and in 1940 from the Institute with high honors. After graduation, he became associated with his father's firm and there remained until called from a reserve status into active duty in March of 1941. In September, 1941, Lieutenant Teich left for the Philippine Islands as an aviation ordnance officer with the 692d Ordnance Division, 10th Pursuit Wing. In the interim he received specialized schooling at Aberdeen Proving Ground, Aberdeen, Md., and Hamilton Field, Calif.

Another member of our Class, Dean E. Swift, died of poliomyelitis in Manila early in January of this year. Colonel Swift served in both Europe and the Pacific. He participated in the Italian campaign and was wounded in the battle for Cassino. After his recovery, his unit was made a part of the Seventh Army, which invaded

southern France and fought through the Vosges mountains and across the Rhine. Colonel Swift was sent directly from Europe to the Philippines last June and had headquarters in Manila.

M. Richard Erickson, we understand, is writing his thesis for an advanced degree in geology at the University of California. Work upon it was interrupted when he joined the Marine Corps in 1941. Captain Erickson spent two years in the Solomons and was placed on inactive duty in January. — John G. Leschen is working as a metallurgist for the National Research Corporation of Boston.

In the Brighton, Mass., *Citizen* we recently read an interesting account of the experiences of ex-Captain Stanley C. Skeiber. They ran as follows: "Skeiber's two-day defiance of death took place in October, 1944, on the southern sector of the front lines in France. It started with a head-on jeep collision one night on a blacked-out roadway. Skeiber should have been killed right then — but he wasn't even hurt. Jeepless, the young army captain had to ride on the fender of another jeep the next morning. It was while he was thus perilously proceeding that one of the little car's wheels ran directly over three German mines. The mines did what you might expect them to do, but in the huge triple explosion Skeiber didn't get a scratch. He continued on foot through the Nazi-infested area until he came to a house. Skeiber ducked inside, found six other men there. A moment after he entered the room two artillery shells followed him in, undoubtedly to show him that his dogtag number matched the shell numbers. The shells missed Skeiber, wounded the others. He left the house, walked on, came to another house. The captain edged around a corner of it, saw a German soldier. The Nazi turned — and saw Skeiber, who was alone. So the German, for no reason anyone can figure out, decided he was surrounded and yelled to his pals in the house to come out and give up. So all 20 of them marched out and surrendered to Skeiber, who called it a day then and there."

Maxwell Small is an industrial engineering consultant on the staff of the industrial bureau of the Chamber of Commerce of Worcester, Mass. He was previously assistant superintendent of machinery at the Federal Shipbuilding and Dry Dock Company of Kearney, N.J. — Mr. and Mrs. E. W. Aske have moved to Shelburne Harbor, Vt., where he is treasurer of the recently formed Shelburne Harbor Ship and Marine Construction Corporation. — Veronica Gertrude Callahan and Charles H. Markham, a captain in the Air Forces, were united in marriage last February. Elaine Corinne la Pierre and David Hamilton Fleming, Jr., were married in East Orange also in February. — Last fall, during the time that we were picking up and moving across the country again, I received a notice from Mr. and Mrs. Robert Green Hall, 3d, of the birth of a son, Matthew Warren Hall, 5th, on October 24. Perhaps we may send congratulations on the fifth's nine-month birthday. — H. GARRETT WRIGHT, *General Secretary*, Garrett Construction Company, 510 Sherman Avenue, Springfield, Mo. THOMAS F. CREAMER, *Assistant Secretary*, 2032 Belmont Road, Northwest, Washington, D.C.

"Come Back to Tech" — Saturday, June 8 — Old-Time Alumni Day Celebration

1941

A small group of '41 Boston Beavers met on a quiet Saturday afternoon in the latter part of March for the purpose of discussing the coming fifth reunion of our Class. Will Mott made a special trip from Hillburn, N.Y., to preside at the meeting. It was decided that a committee comprising Don Howard, Dave Howard, and John Sexton should determine a suitable location and make the arrangements for a gala 1941 dinner on Friday evening, June 7, and that John Sexton should be in charge of housing as many out-of-town guests as possible. With the present hotel situation in mind and a desire for maximum attendance at our first real reunion, John suggested that all the local families offer their guest rooms and couches. Let's hope that this plan will enable many to come back to renew old acquaintances.

Arnold Mengel, who is now studying for a master's degree, with his wife and baby living near by, reports that he is really learning something this time. Don and Dave Howard are both working for their own fathers. John Sexton is with Don in the development department of Bemis Associates in Watertown. Don Scarff is back in town working for General Electric in the lamp department. He and his family are living in Belmont. Fred Came is with a small plastic plant in Providence and is planning to move his family to that city very shortly.

Johan Andersen, your assistant notes writer, announced that his wife had presented him with a baby daughter on March 12 and that he has started a small manufacturing company in Hopkinton. The entire group had hoped that our Secretary, Stan Backer, could be present. We hope that he will come home soon. We have news of one faithful Alumnus who is coming from California for our June reunion — Larry Turnock. May many more come back, no matter what the distance, to make this a real reunion! — STANLEY BACKER, *General Secretary*, 101 Providence Road, Primos, Pa. JOHAN M. ANDERSEN, *Assistant Secretary*, Saddle Hill Farm, Hopkinton, Mass.

1942

Quite a large delegation from the Class attended the Alumni Banquet on February 23. The following is a list of those attending with any pertinent information accompanying each name: Dave Nicholson, who is working for the Kollsman Instrument Company in Elmhurst, N.Y.; Ed O'Brien, who is back at M.I.T. as a student; L. L. Bowers, who is now living in Floral Park, Long Island; Hawk Shaw, who is now at the Massachusetts General Hospital as an intern; Art Power of Waltham, Mass.; Charlie Hofmann, who is a research associate at M.I.T.; Dick Seidman and Lou Rosenblum, both of Polaroid; Adrian Marcuse, who is living in Boston at present; Felix de Leo of Dorchester; John Barry of Hingham; Charlie Prohaska of Bloomfield, Conn.; Pete Volanakis of West Springfield, Mass.; Bill Tallman, who is working at the Institute; Ed Todd of Newburyport; Warren Twaddle, Larry Breves, and Ed Thode, all back at Tech as students; John Arnold of Rockland, Mass.; Stan Golembe, who is working for the New

England Transformer Corporation in Somerville; Bill Devine back at the Institute; Ed Gartland, who is working for General Alloys in Boston; Ed Pepper, A. G. Waggoner, Malcolm McGregor, Tom Crowley, Leon Freeman, L. T. Holden, Henry Hill, and Warren Loud.

Engagements for the last two or three months show that Bill Denhard is engaged to Barbara Ann Smith of Bartlett, N.H. Bill is stationed at Camp Lee, Virginia, for the present. Warren Powers is engaged to Jean Ann Caparn of Arlington, Mass. Warren is a navigator aboard the U.S.S. *Monongahela* in the Pacific area. Herb Brach is engaged to Elizabeth O'Brien of Watertown.

Jim Burns is recently discharged, after having served for two years in the Navy as a radio technician. He is married and living in Quincy and has been seen several times lately around the Institute. Leon Baghdoyan was recently released from the U.S.N.R. after 33 months' service in the department of aircraft maintenance. Dr. Hu Seng-Chiu, one of the fellows who got a graduate degree in 1942, has turned out to be a budding industrialist. His present efforts are bent towards trying to obtain some surplus war materials to help China. He states that the huge United States surplus could contribute much to the development and well-being of the Chinese people. He is now negotiating for the use of an idle war plant in New Jersey, where it is planned to manufacture 200,000 refrigerators in the next two years before both plant and workers are moved to China. He also has signed a contract to convert 7,000 surplus United States aircraft engines into power plants which will pump water and make electricity for Chinese communities.

Bob Frost is on terminal leave after three and one-half years of active duty in the Navy and will soon begin work in an engineering capacity with W. R. Grace and Company of New York. We understand that he will be sent to Lima, Peru. James R. Downing, who has been working with the atomic bomb project since 1942, has been appointed director of research at the Cook Electric Company in Chicago. He received his Ph.D. degree in 1942. Art Power is on terminal leave after almost four years' service in the Army Ordnance. During the war his unit was attached to the Ninth Infantry Division under General Patton and was engaged in large-scale ammunition supply work. He expects to pick up where he left off at Technology for some graduate study. Bernard Greenes has been awarded the Bronze Star for having distinguished himself in connection with operations against the enemy. Serving as chemical munitions officer and later as executive officer of the chemical section, he was responsible for the tests, assembly of equipment, and improvisations which led to the very effective part fire bombs played in air warfare in the China-Burma-India theater. Leo Penn has been awarded the Bronze Star posthumously for meritorious achievement in connection with military operations in New Guinea and the Philippine Islands. His death has been reported previously in this column.

Unfortunately we must list another man killed in action. The War Department now confirms that Robert Kunz, who was re-

ported missing in action over China on June 19, 1945, was actually killed in action on that day. Major Kunz has been posthumously awarded the Distinguished Flying Cross for meritorious achievement while accomplishing three missions, when voluntarily, with complete disregard for his personal safety, he landed a stripped down B-25 at a secret airstrip and successfully evacuated 24 American airmen from a point behind enemy lines more than 300 miles from the nearest Army Air Forces installation.

Brad Darling, who is at present trying to decide to which company in metropolitan Boston he will lend his talents, was married on March 17 to Ann Marsters. Brad has been visiting the Institute quite frequently of late and seems to be bearing up well under the strain of married life. In fact, he is even thinking of taking a job on a research project in the Chemical Engineering Department. Bill Graham is on terminal leave from the Navy and was married to Dorothy Reilly on February 21. The couple plans to live in Lyndhurst, N.J. Dick Small was married to Lucy Jane Vance on February 22. A letter from Bob Curtis discloses that last September he was married to Eleanor Johnson of Germantown, Pa. The couple is living in Paoli, Pa., at present and Bob expects to be out of the Navy this month.

A long epistle has arrived from Heinie Shaw. It seems that he has been out of communication for quite some time and had just finished reading a stack of Reviews when he wrote the letter — the first ones that he had seen in 18 months. He rambles on as follows: "In case you are curious, I'm not in the Army, but am just a civilian in sheep's clothing, an employee of the United Aircraft Corporation. I've been out a year and a half, having landed on Saipan in October, 1944. Since, I have dodged steel during the Iwo campaign, grubbed out a home on Guam, promoted a diversionary trip to the South Seas just before the end of the war, and spent a few pleasant weeks in Japan. Being concerned mainly with the B-29's, I have had a mighty interesting time of it working with the air offensive in Japan from its infancy. Another thing which has made the stay in the Pacific interesting has been the continuing stream of old friends I have run into. Fred Baumann was the first; in fact I had a couple of beers with him the night before he took out on his last mission. He was a bombardier in Lieutenant Colonel Pappy Haines' squadron, you know. Another afternoon, while down at the Fleet Officers' Club spending time, I caught the eye of one of the more jovial naval lieutenants who had a familiar look about him. Naturally, it was one of our esteemed classmates, Dick Strong, to be precise. He was a gunnery control officer on one of the ships then in the harbor. Norm Klivans '41, a major, I used to run into regularly. He was a weatherman located at various times on Saipan, Oahu, and Guam. One of the service center radar officers with the 73d Wing on Saipan was Gene Rips, a lieutenant. I was with the 73d about four months and used to see him often. On the way to Hokkaido with General Armstrong's Eastway Project B-29's last November, we stopped overnight at Iwo. Feeling my way through the sulphur steam

of a shower that afternoon, I was brought up short by someone yelling my name. And who should emerge from under one of the nozzles but Bob Riebe. He was a lieutenant with a troop carrier outfit stationed at Tachikawa, Honshu, and was at Iwo piloting a C-46. Coming back from Hokkaido after the General's departure for Washington, we stopped a few days at Tokyo. Riding the train one afternoon from Iwo back to Atsugi Field, I ran into W. G. Poole '43. He was a lieutenant in the Engineers and lived at some country club outside of Tokyo. There were others from other classes, such as Wes Cilley '38, a lieutenant; Lieutenant Colonel Owen '20; Lieutenant Commander Levy '41; Tom Bowman '40, a major, and so on. To cap it off, about a month ago I found none other than Lieutenant Hank Titzler trying to spend pesos at our PX. Hank, who has been at Wright Field, C.I.T., and other such spots during the war, came out to the Far Eastern Army Service Command about three months ago. He was in Tokyo awhile, then moved on to Manila, where Colonel Irvine snapped him up. He is now here at 20th working with us on one of Colonel Irvine's new projects." — S. YOUNG TYREE, JR., *Assistant Secretary*, Room 2-215, M.I.T., Cambridge 39, Mass.

1945

It's great to be able to report so many of the original Class of 1945 being back again at the Institute. Peregrinating the passages of our fond alma mater have been noticed such old stand-bys as Ted Hogg, Ray Frodey, Lew Bernheim, Arnold Singer, Art Wong, George Fischer, Martin Schwartz, Oiva Anderson, Don van Greenby, Steve Dieckmann, Ted Hossfeld, Bob Thirkield, Larry Barber, Bill Lam, and Vic Ransom. I wish I could have had an opportunity to speak with all these fellows to tell you what they've been up to.

Some of the others around Technology again are Joe Kelly, who has the hobby of taking trips to Staten Island, New York, to see his fiancée, whom he plans to marry at the end of the current term in June; Harold Steiner, who recently introduced me to a Miss Shirley Hill of Hawaii, to whom he is engaged and planning to be

wed on June 9; and Pete Hill, who is living here with his wife. Meeting Dan Lord on the street a few nights ago, I put forth the conventional greeting, "How are the women treating you?" to which his modestly gleeful reply was "Not too badly; I just got engaged last night." His betrothal is to Dorothy Mead, from Marblehead, Mass., a student at Sargent College. The unanimously feminine affiliations of the above boys must be rather disheartening to the confirmed bachelor and brown-bagger groups of our Class, but I was able to gather from these fellows statements to appease these groups; namely, that they much more readily appreciate their studies than they did back in 1941 and are quite happy to be back. The one unattached returning veteran with whom I've spoken is Paul Anderson (no relative of Oiva's), who was a meteorology instructor in the Air Forces. Some plan to return to finish their undergraduate grind in the near future, among them Bob Barnes, who is coming back in June for the summer term, Gene Ashley, Al Davisson, and Tom Cooper, who will be on hand once more in the fall.

So much for the fellows returning as students. Not a few are working here in various sorts of jobs. George Wilson is affiliated with surplus property disposal and acquisition for the Institute. John Rueckert has been working in the Radiation Laboratory while in the Navy and sporting a wife. He plans to be discharged soon and finish his final year in Course VI. John Granlund, lately discharged from the Navy, is working, as is the writer of these notes, in the newly formed Electronics Laboratory, a sort of outgrowth of the Radiation Laboratory. Hank Paynter has also been enhancing Technology, though I can't say that I know what he's doing.

Bob Ilfeld (who finished in 2-44, but began with our Class) recently wrote a letter, from which I quote in part: "After working for a year on the atomic bomb project at Los Alamos, N.M., I was discharged from the Army at Fort Bliss, Texas, on February 18. On February 23, I married Winona Rosenburg, whom I met when I was at Tech and she was at Radcliffe, in Jackson, Mich., her home. We

drove to California, and I began work in the graduate school at Cal Tech. I am working toward my Ph.D. in physics; also here in the graduate school in physics is Walter Garvin."

A few more engagement notices have been received in the past few months. Bill Kalb of varsity crew fame is signed up with Barbara Reynolds of Englewood, N.J., a student at Wellesley. Bill, incidentally, is in the Navy as an ensign. Bob Horsburgh, also an ensign, is engaged to Ellen Lucey of Natick, a graduate of Lasell. Walter Lang has a similar affiliation with Jean Buckingham of Roslindale, a graduate of Boston University. Bruce Dodd, an ensign, acquired as fiancée Rosalie Van Everen of Montclair, N.J., who attended the Walnut Hill School in Natick.

The news may be brought to a close for the time being with the word of two marriages: that of Bill Noyes, an ensign, to Eleanor Elizabeth Lowell of Amesbury, Mass., and that of Charles Alvin Burmaster, an Army captain, to Harriett Emily Chatfield of Seymour, Conn. — JAMES S. MULHOLLAND, JR., *General Secretary*, 1172 77th Street, Brooklyn, N.Y. *Assistant Secretaries*: RODERICK L. HARRIS, 1 Winchester Street, Brookline 46, Mass.; JAMES B. ANGELL, 530 Beacon Street, Boston 15, Mass.

1946

Hi, fellows: Where are all those chatty notes I was promised? How do you expect to get any news if you slipstick pushers don't furnish it?

Perhaps you will be interested to know that five of our classmates recently took the fatal step. Charlie McKinney, an ensign, married Diana Sullivan of Weston, Mass., on February 25. On this same fateful day, Bob Walters, an ensign, took Frances Bird of Dedham, Mass., as his bride. In Waban, Bob White, an ensign, joined hands with Barbara Wiley of Newtonville, Mass. Also reported is the engagement of Stan Landgraf to Priscilla Tite of Mount Lebanon, Pa.

That's all there is, boys. Get busy and write if you want us to remember you. — JAMES S. CRAIG, *General Secretary*, 77 Woodruff Avenue, Scarsdale, N.Y. THOMAS F. KELLY, JR., *Assistant Secretary*, 578 Andover Street, Lowell, Mass.

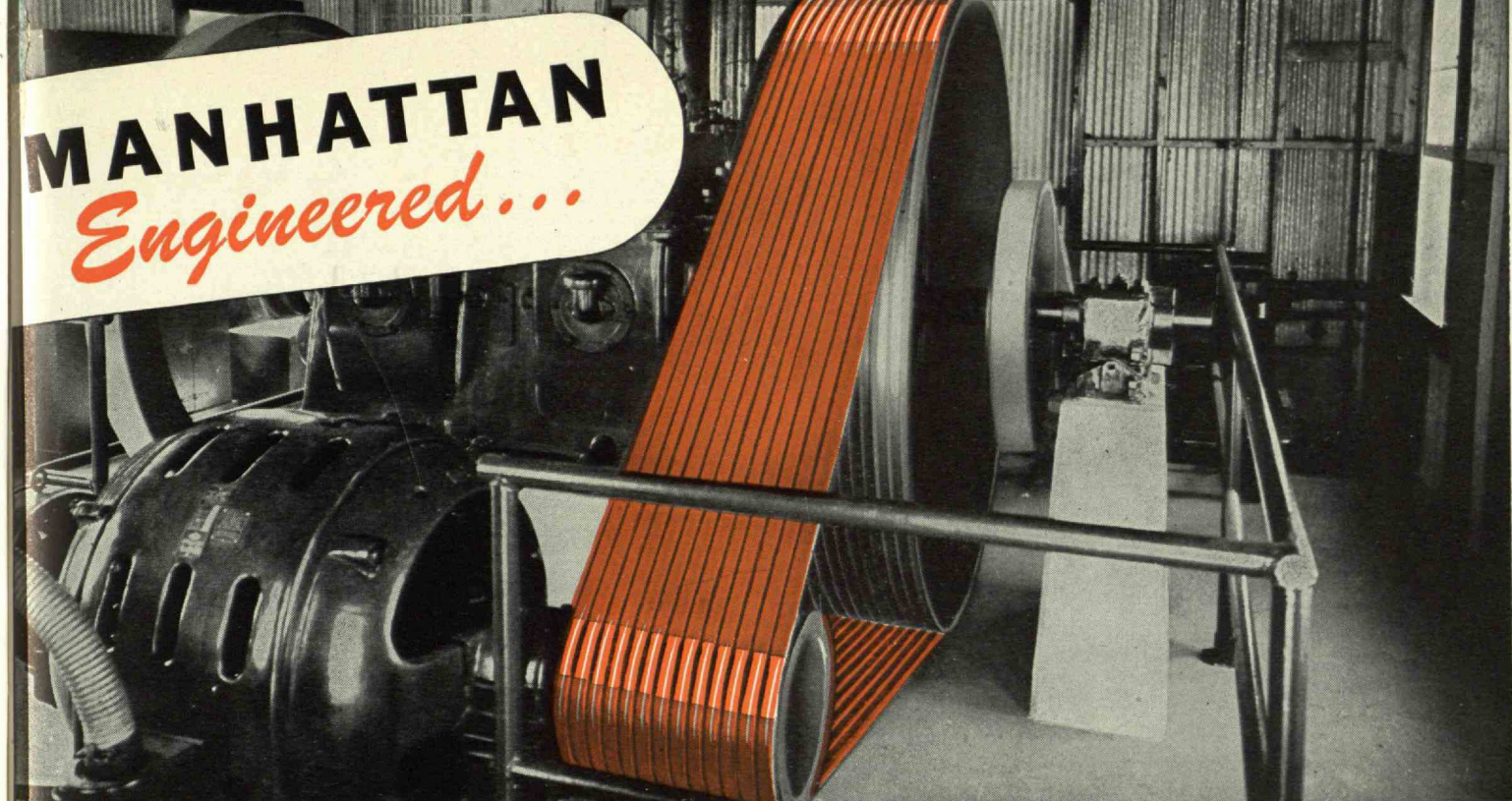
LAST CALL

Alumni Day—June 8, 1946

<i>Morning</i>	Registration and Inspection of Buildings
<i>Noon</i>	Luncheon — Du Pont Court
<i>Afternoon</i>	Symposium — "The Technology of International Peace" — Walker Memorial
<i>Evening</i>	Stein-on-the-Table Banquet — Hotel Statler

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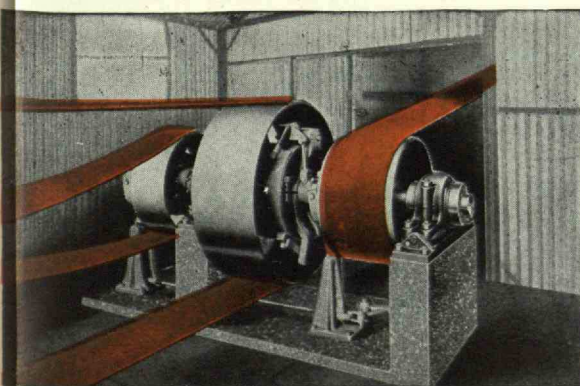
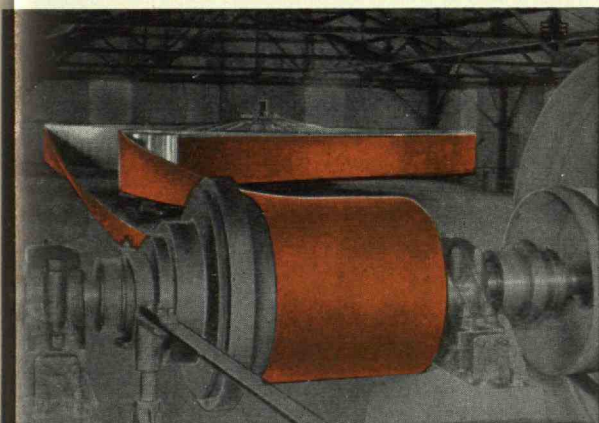
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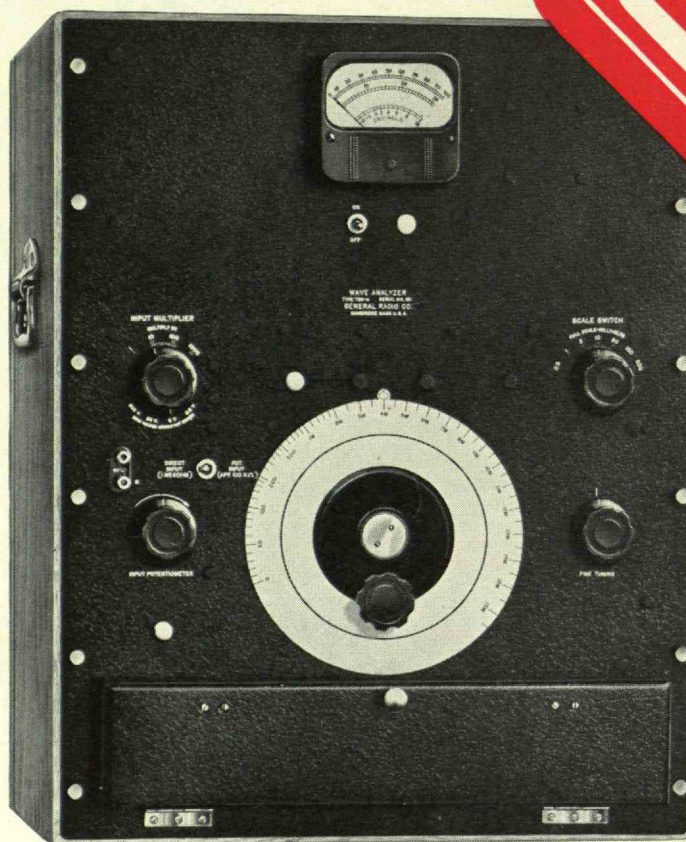


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